COPY FOR MR. J. ALLAN ROSS

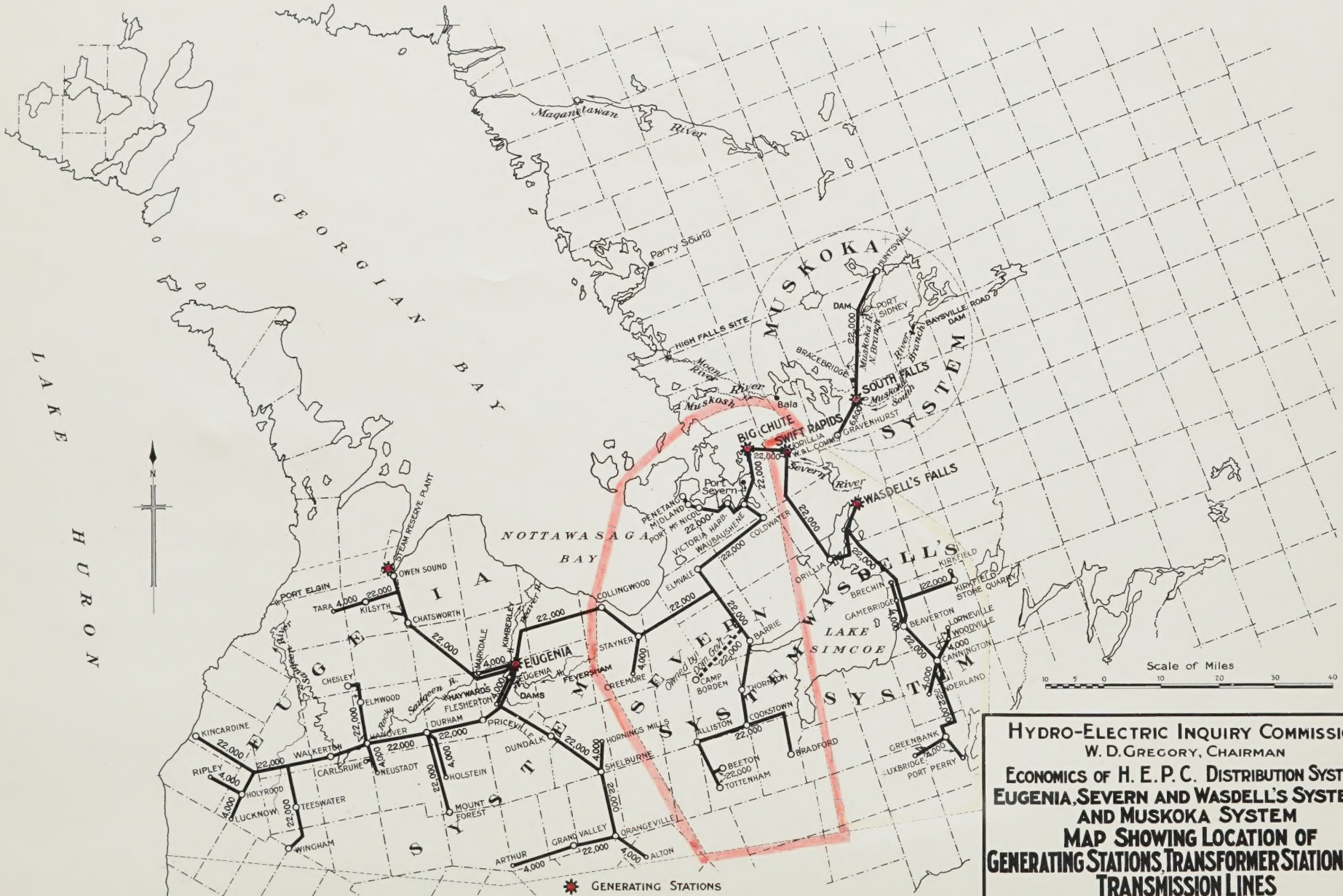
HYDRO-ELECTRIC INQUIRY COMMISSION

GENERAL REPORT

SEVERN SYSTEM

JOSEPH H. W. BOWER
SECRETARY

SEVERN SYSTEM



Hydro-Electric Inquiry Commission

W. D. Gregory, Chairman

Economics of H. E. P. C. Distribution Systems
Eugenia, Severn and Wasdell's Systems, and Muskoka System
Map Showing Location of Generating Stations, Transformer Stations and Transmission Lines

Toronto, Feb. 26th., 1923. Made by [illegible] Checked by [illegible]

Walter J. Francis & Company
Consulting Engineers

General Map Showing Location of

Generating Stations, Transformer Stations and Transmission

Lines of the

Hydro-Electric Power Commission of Ontario

The area outlined in red

shows the Severn System.

General Map Showing Location of Generating Stations, Transformer Stations and Transmission Lines of the Hydro-Electric Power Commission of Ontario

The area outlined in red shows the Severn System.

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Toronto, Ontario,
August 17th, 1923.

Hydro-Electric Inquiry Commission,
W. D. Gregory, Esq., Chairman,
Toronto, Ontario.

re: General Report - Severn System

Mr. Chairman and Gentlemen:-

In accordance with your instructions, a general report on the Severn System has been made, along the lines approved of by the Commission on January 2nd. The work has been done under my direct personal supervision as per your instructions.

The reports of Messrs. Price, Waterhouse & Company and Messrs. Clarkson, Gordon & Dilworth, together with the report on this System by the Commission's Consulting Engineer, Mr. Walter J. Francis, have been used in the preparation of this report. No public hearing was held in connection with this System.

The report falls naturally into parts. The first part includes sections entitled "Historical Sketch", "Physical", "General Economics" and "General Relations." These sections are largely a recital of facts. The second part of the report entitled "Summary" is merely intended to direct attention to those points which appear to require special consideration by the Commission.

Particular attention is directed to a sub-section of the report entitled "Addenda", which deals with the revision recently made in the reserve for renewals account.

All figures used in this report have been carefully checked by a representative of Messrs. Price, Waterhouse & Company. Reports forming the basis of this report are appended hereto, and in order to facilitate reference to the documents in question, on the right-hand margin of the report throughout will be found abbreviated references.

Yours very truly,

JHWB/G

J. H. W. Bauer
Secretary.

Toronto, Ontario,
August 17th, 1923.

Hydro-Electric Inquiry Commission,
W. D. Gregory, Esq., Chairman,
Toronto, Ontario.

Re: Energy Report - Ontario Power

Mr. Chairman and Gentlemen:

In accordance with your instructions, a general report on the various duties has been made, along the lines suggested by the Commission on January 3rd. The work has been done under my direct personal supervision as per your instructions.

The reports of Messrs. Price, Williams & Company and Messrs. Clarkson, Gordon & Dilworth, together with the report on this System by the Consulting Engineer, Mr. Walter L. Creese, have been used in the preparation of this report. No public hearing was held in connection with this System.

The report was necessarily long, the first part includes matters relating to Municipal Ownership, "Financial Management and Financial Relations," these matters are largely a matter of fact. The second part of the report matters "Management" is merely intended to direct attention to those points which appear to require special consideration by the Commission.

Institutionalization is discussed as a sub-section of the report entitled "Industry", which deals with the private rights under in the massive hydro systems.

All figures used in this report have been carefully checked by a representative of Messrs. Price, Williams & Company. Reports forming the basis of this report are appended hereto, and in order to facilitate reference to the documents in question, on the right-hand margin of the report hereunder will be found alphabetical references.

Yours very truly,

[illegible]

[illegible]

COPY

S E V E R N S Y S T E M

HISTORICAL SKETCH

In September 1909, the Simcoe Railway and Power Company of Midland secured a Crown lease permitting it to develop power at the Big Chute on the Severn River to the full capacity of the site, the object being to transmit the power to the towns of Midland and Penetanguishene. The Big Chute generating station was built by this company and was put into service in 1911.

The Hydro-Electric Power Commission, in November 1910, at the request of the municipalities concerned, made a survey and estimated the cost of power supply to Midland and Penetanguishene and, after the necessary by-laws were submitted and passed in January 1911, made a contract with the Simcoe Railway and Power Company to purchase the power required for these two towns. WJP. p.4.

The contract called for an initial delivery of 200 horse-power and additional blocks of 50 horse-power until the total amount so reserved had reached 500 horse-power, then additional blocks of 100 horse-power each until the total amount so reserved reached 1600 horse-power. The price of power under the contract was

200 horse-power -	$21.00	per horse-power per
500 horse-power -	20.00	annum at 2200 volts;
1,000 horse-power -	19.00	$1.00 less for all
1,500 horse-power -	17.50	power at 22,000 volts.

The agreement was to remain in force for ten years and was renewable thereafter for two terms, one of five years, and the next terminating September 10th, 1929, the date upon which the company's lease with the Crown would have expired. HEPC report 1911 p.14

Having built the necessary transmission lines and distributing stations, the Commission began to supply power in July 1911. WJF. p.4.

By the end of the year 1913, the number of municipalities served with power purchased from the Big Chute plant had increased to seven, namely: Barrie, Coldwater, Collingwood, Elmvale, Midland, Penetanguishene, Stayner, and the power demand had more than doubled. At a meeting of the Commission held on March 24th, 1914, the purchase of the Big Chute plant was considered. As a result, on June 30th, 1914, the Commission purchased from the Simcoe Railway and Power Company, its power development, together with its transmission lines and distributing stations. The Order-in-Council permitting the purchase was dated June 17th, 1914. It set the purchase price at $475,000.00. P.W. Ex. IV. WJF. p.5.

On October 1st, 1912, Mr. H. G. Acres, Hydraulic Engineer of the Commission, had reported to Sir Adam Beck, giving a detailed valuation of the system of the Simcoe Railway and Power Company, and naming the sum of $400,000.00 as an outside purchase price, but this figure apparently did not include the undeveloped power site at Port Severn which was owned in fee simple by the company. The actual cost of the properties, apparently including the Port Severn site, as WJF. p.6.

entered in the records of the Commission at June, 1914, is given as $475,355.01.

Previous to the acquisition of the Big Chute plant, the Commission had purchased all the power for the Severn System from the Simcoe Railway and Power Company from the Big Chute plant. Since the date of purchase, the power required has been generated at the Big Chute plant and purchased from the Eugenia and Wasdell's Systems. WJF. p.6.

In the latter part of 1916, a tie line between the power house at Eugenia and the Severn System lines at Collingwood was constructed, thus enabling the Commission to market the surplus power available at the Eugenia Development in the municipalities located in the Severn district. HEPC Report 1917 p.153.

In 1916 negotiations were carried on between the Town of Orillia and the Commission covering the sale of power from the Orillia-Swift Rapids Development, for use on the Severn System, and also covering the interchange of power between the Orillia System and the Commission's developments at Big Chute, Eugenia Falls and Wasdell's Falls. HEPC Report 1916 p.172

A short term agreement was also entered into on August 15th, 1916, between the Water & Light Commission of the Town of Orillia and the Commission covering the purchase by the town of 2,000 horse-power required for the use of munition plants in the municipalities prior to the completion of the Swift Rapids Development. This agreement also provided for the joint use of transmission lines by both parties.

entered in the records of the Commission as June, 1919, in
given as $425,000.00.

Previous to the negotiations of the Big Chute plant,
the Commission had purchased all the power for the Ontario
System from the Ottawa Gatineau and Power Company from the Big
Chute plant. Since the date of purchase, the power available
has been generated at the Big Chute plant and transmitted over
the Toronto and Niagara System.

In the latter part of 1919, a six line between
the power houses at Toronto and the Niagara Power Lines at
Gatineau was completed, thus enabling the Commission to
market the surplus power available at the Ontario Generating
in the municipalities located in the Eastern District.

In 1919 negotiations were carried on between the
Town of Orillia and the Commission regarding the sale of power
from the Orillia-Swift Rapids Development, for use on the
Eastern System, and also covering the interchange of power
between the Orillia System and the Commission's Hydro-Electric
market at Big Chute, Gogamah Falls and Trowell's Falls.

A short term agreement was also entered into on
August 11th, 1919, between the Town & Light Commission of
the Town of Orillia and the Commission covering the purchase
of the Town of 1,000 horse-power required for the use of
municipal plants in the municipalities prior to the completion
of the Swift Rapids development. This agreement also provided
for the joint use of transmission lines by both parties.

In 1917, negotiations were completed for the purchase from the Orillia Water & Light Commission of the seven and one-half miles of conductor extending from the Big Chute plant to a point approximately south of the Orillia Commission's power house at Swift Rapids, thus obtaining a permanent connection between the Big Chute and the Swift Rapids plants and completing the link between the Severn and Wasdell's Systems by the use of the Orillia Commission lines. HEPC Report 1917 p.98.

In 1917, an additional contract was executed between the Town of Orillia and the Commission covering a permanent supply of power from the Swift Rapids plant under construction by the town. The contract covered the paralleling of the Swift Rapids generating station with the generating stations located at the Big Chute, Wasdell's and Eugenia, the joint use of transmission lines and the supplying of emergency power by both parties. HEPC Report 1917 p.153

A new agreement between the Town of Orillia and the Commission covering the transfer of power from the Wasdell's System to the Big Chute Development by means of the Orillia transmission lines and generating station for the purpose of utilizing the surplus power of the Wasdell's Development on the Severn System became effective November 1st, 1918. This agreement also covered the purchase of surplus power from the Orillia System when same was required for serving the municipalities of the Severn System, as well as the paralleling of the Eugenia, Severn and Wasdell's Developments with the Orillia System for standby service. HEPC Report 1919 p.244

In 1914, negotiations were completed for the purchase from the Drilling Co. of a light transmission of the power and one-half miles of secondary extending from the big Chute plant to a point approximately equal at the Drilling Company's power house on Moira River. Then obtaining a permanent connection between the Big Chute and the North Bridge plants and completing the line between the Trenton and Madoc's Falls by the use of the Drilling transmission lines.

In 1917, an additional agreement was executed between the Town of Drilling and the Commission covering a permanent supply of power from the Bridge Falls plant under conditions by which the municipal operated the distributing of the North Bridge generating station with the generating stations located at the Big Chute, Madoc's and Trenton. The joint use of transmission lines and the supplying of secondary power by both parties.

A new agreement between the Town of Drilling and the Commission covering the transfer of power from the Madoc's Falls to the Big Chute distributed by means of the Drilling transmission lines and generating stations for the purpose of maintaining the supply power at the Madoc's Transformer on the Power Spring Brown effective January 1st, 1919. This agreement also covered the purchase of surplus power from the Drilling Power Plant when same was required for serving the municipalities of the Brown System, as well as the purchasing of the Drilling, Trenton and Madoc's Transformers with the Drilling System for standby service.

On account of the rapid increase of the load in the system it became necessary, early in 1917, to proceed with the extension of the Big Chute generating station; a second steel penstock was purchased; a double runner turbine of 2,300 horse-power capacity and two gate valves were installed; and a 1600 kv-a. horizontal generator was finally put into commercial service January 28th, 1919. WJP. p.10

At October 31st, 1921, seventeen municipalities and three other customers, as shown by the following list, were supplied with power:

Alliston	Elmvale
Barrie	Midland
Beeton	Penetanguishene
Bradford	Port McNicoll
Coldwater	Stayner
Collingwood	Thornton
Cookstown	Tottenham
Creemore	Victoria Harbour
	Waubaushene

P.W. Ex. IV.

Canadian Pacific Railway (Elevator)

Camp Borden (Canadian Air Board) P.W. p.6.

Department of Railways and Canals

In support of the rapid increase of the load in the system it became necessary, early in 1919, to provide with the extension of the Big Chute generating station a second about twenty-two thousand a static rotary transformer of 2,300 kilo-watts capacity and two pole rotors were installed and a 110/ kv. balanced generator was finally put into commercial service January 1919.

In October 1921, extensive modifications and there water transmission, as alone by the Kaministiquia, were supplied with power.

Canadian Pacific Railway (Governor)
Lake Superior (Dominion Air Force)
Department of Railways and Canals

PHYSICAL

The Severn System supplies the territory in the northern and central portions of Simcoe County, between Georgian Bay and Lake Simcoe. WJP. p.7.

Speaking generally, the system consists of a hydro-electric generating plant at Big Chute on the Severn River, tie lines to permit the interchange of power between the Severn, Eugenia and Wasdell's Systems, and transmission lines and distributing stations feeding seventeen municipalities, and some rural lines. WJP. p.9.

Generating Station and Other Sources of Power Supply

The Big Chute plant is the only generating station on the system at present owned by the Commission.

This development is located on the Severn River about nine miles from the mouth and includes dams at the head of each of the three channels into which the river divides at this point. The dam at Big Chute, the principal point of discharge, is fifty feet long and eighteen feet high, constructed of concrete piers and sills with stop-logs and spill-crests. Pretty Channel dam is of somewhat similar construction, with no spill-crest. Lost Channel dam is in a narrow gorge and is of concrete and contains one spillway. Near Big Chute dam a canal 32 feet wide and 500 feet long has been cut through the rock and leads to a forebay,

from which at the present time the water is carried through two nine-foot penstocks, 150 and 170 feet long respectively, to the concrete power house where a 56-foot head is available. The second of these two penstocks was installed in 1918.

The original equipment consisted of three 1,300 horse-power turbines, each direct-connected to a 900 K.V.A., 3-phase, 60-cycle, 2,200-volt, horizontal type generator, with two independent 100-kilowatt exciter units, and six 600-kilowatt station transformers stepping the voltage up from 2,200 to 25,000 volts.

This station was put into service in 1911, being then the property of the Simcoe Railway and Power Company, but in 1914 it was purchased by the Commission to supply power to the system. On account of the rapid increase of the load on the system, it became necessary, early in 1917, to proceed with the extension of the Big Chute generating station. The second steel penstock, 9 feet in diameter and 170 feet long, was purchased from the Dominion Bridge Company of Montreal. A double runner, spiral case turbine of 2,300 horse-power capacity under 56 feet head, running at 300 revolutions per minute, was supplied by the Wellman-Seaver-Morgan Company, and two 66-inch gate valves were installed, and a 1,600 K.V.A., 3-phase, 60-cycle, 2,200-volt, horizontal type generator was purchased from the Canadian General Electric Company, and finally put into commercial service on January 28th, 1919.

service on January 28th, 1919.

General Electric Company, and finally the idea occurred to authorized type generator was purchased from the Jenkins Ewalds, and a 1,500 K.V.A., 6-phase, 60-cycle, 2,300-volt Eastern-Stayton Company, and two 40-inch gas engines were installed by the Williamson Pump and Machinery Co. of Kansas. A double reactor, which acts as the 1,500 horse-power engine under its own head, running at 150 revolutions per minute, was supplied by the Williamson Pump and Machinery Co. of Kansas. A double reactor, which acts as the 1,500 horse-power engine under its own head, running at 150 revolutions per minute, was supplied by the Williamson-Stayton Company, and two 40-inch gas engines were installed, and a 1,500 K.V.A., 6-phase, 60-cycle, 2,300-volt type generator, with its independent 100-ampere exciter unit, and a 400-ampere station transformer employing the voltage of from 2,300 to 22,000 volts.

This station was put into service in 1912, when the property of the Pikes Peak Power Company, was in 1916 is was purchased by the Consolidated Company to the system. In account of the rapid increase of the load on the system, it became necessary, early in 1917, to proceed with the extension of the old steam generating station. The second steam generator, a 2,000 horse-power Allis-Chalmers Corliss type, was purchased from the Detroit Engine Works of Detroit. A double reactor, which acts as the 1,500 horse-power engine under its own head, running at 150 revolutions per minute, was supplied by the Williamson-Stayton Company, and two 40-inch gas engines were installed, and a 1,500 K.V.A., 6-phase, 60-cycle, 2,300-volt

The original capacity of the plant, in accordance with the rating of the Commission, was about 2,900 horse-power at 80 per cent. power factor, while the present capacity is about 4,600 horse-power. WJF. p.9. & 10.

Undeveloped Power Sites

The only undeveloped power site of commercial capacity on the system is that near Port Severn on the Severn River, a short distance downstream from Big Chute. This power site was taken over by the Commission with the other properties of the Simcoe Railway and Power Company when the Big Chute development was purchased. Details of this site are given on page 14 of our Consulting Engineer's report.

For a number of years past there has been a dam and lock at Port Severn, built by the Federal Government in connection with the Trent Canal works. It is stated by the Trent Canal officials that the normal lift at this lock is 14.5 feet. When the dam and lock were built, provision was made in the design for the future connection of a power plant at this point, and it is understood that the Commission intends to take advantage of the partly developed conditions at Port Severn by installing a power development during the present year.

The original company of the plant, in association with the railway at the Tunnelsiding, was about 1,000 horse-power of 80 per cent. power factor, while the present capacity is about 1,000 horse-power.

Underground Power Plant

The only underground power site of economic importance on the rivers in this most part lying on the Sturgeon River, a short distance downstream from the City. This power site was taken over by the Commission with the other properties of the Sturgeon Falling and Power Company when the City Clerk Authorized was purchased. Details of this site are given on page 14 of the Investigating Engineer's report.

For a number of years power shortage has been a bugbear and less so this winter, both in the Fourteen Corners in connection with the Twin Cities works. It is stated by the Trent Dams Commission that the natural life of this dam in 14½ years. Then the dam and lock water will. Provision has been in the design for the future construction of a power plant at this point. And it is understood that the Commission intends to take advantage of the partly developed condition of Port Arthur by installing a power development during the ensuing year.

It is stated by the engineers that the estimated expenditures for 1922 and 1923 include a sum of $275,000.00 for the development of the power plant at Port Severn. The dependable power from this site with a flow of 1,000 cubic feet per second, and a head of 12.5 feet, would be about 1,200 horse-power, continuous capacity, but allowing for the pondage effect above the dam it is likely that a large capacity might be installed to advantage. Having regard to the uncertainty in the regulated flow of the river, and the local conditions at the site, it is probable that from 1,500 to 1,800 horse-power installed capacity is all that might be utilized for commercial service. WJF. p.15.

At July 31st, 1923, this development had not been undertaken by the Commission. WHB. 31/7/23.

Miscellaneous Power Plants

With the single exception of the Swift Rapids development of the Orillia Water, Light and Power Commission there are no power plants in the district which are worthy of note.

A short description of the above plant is given on pages 16 and 17 of our Consulting Engineer's report.

The only other private plants in the district are located in Alliston, Beeton and Tottenham. The combined capacity of these three plants is 132 kilowatts.

It is stated by the engineers that a gas turbine equipment for 1942 and 1943 implies a cost of $472,000.00 for the installation of the power plant at Cape Cabrera. The generating power from this site with a flow of 3,750 cubic feet per second, and a head of 124.1 feet, would be about 3,400 horsepower, continuous capacity, but allowing for the peaking nature of the load it is likely that a turbo-generator might be installed to advantage. Having regard to the uncertainty in the regulated flow of the river, and the local conditions at the site, it is probable that from 1,800 to 1,400 horsepower installed capacity in all would be utilized for commercial purposes.

At Cape Ann, 1942, site development has not been undertaken by the Commission.

Miscellaneous Water Plants

With the single exception of the water heating equipment of the Orillia Water, Light and Power Commission there are no power plants in the district which are worthy of note.

A short description of the water plant is given on page 11 of the Barnstaing Engineer's report.

The only other private plants in the district are located in Alliston, Beeton and Tottenham. The electrical capacity of these plants is 124 kilowatts.

Transmission Lines

Up to October 31st, 1921, the Commission had acquired or constructed 178 miles of high voltage transmission lines including about 7 miles of 4,000-volt lines and about 171 miles of 22,000-volt lines forming a network supplying the various municipalities, and also connecting together for parallel operation the generating stations of the Eugenia, Severn and Wasdell's Systems, and the Swift Rapids station of the Orillia Water, Light and Power Commission.

The transmission system is constructed on wooden poles throughout and presents no extraordinary features. Extensions estimated to cost about $100,000.00 for each of the years 1922 and 1923 are said to be contemplated covering miscellaneous lines and distributing stations and a considerable extension of the rural lines. WJF . p.17.

Transforming & Distributing Stations

The transmission lines feed the various municipalities at low voltage through seventeen substations, a list of which stations showing voltage and capacity is given on page 18 of Mr. Walter J. Francis' report.

Local Distributing Systems

With the exception of the rural lines there are no municipalities on the Severn System in which the Commission distributes retail power to the consumers. The

Transmission Lines

On or about July, 1921, the Commission had adopted or tentatively 132 miles of high voltage transmission lines involving about 7 miles of 6,600-volt lines and about 121 miles of 22,000-volt lines serving a network supplying the various municipalities, and also transmitting power to private operators the generating stations of the Sierra, Pacific and Bradley's Cascade, and the Bear Valley Irrigation Station. At the utility rates, light and power transmission.

The transmission system is constructed on wooden poles throughout and presents an extraordinary feature. Expenses estimated in over about 127,000.00 for each of the years 1921 and 1922 are said to be consumated erecting wheelbarrow lines and distributing station and a considerable expansion of the rural zones.

Transformer & Distributing Stations

The transmission lines feed the various municipalities as low voltage through transformer substations, a list of which stations showing voltage and capacity is given on page 22 of Dr. Quinn's Pacific report.

Local Distribution Systems

With the exception of the rural lines there are no municipalities or its agents Oregon in which the distribution distributors retail power to the consumers. The

Commission acts as a wholesale distributor only and in all the municipalities the electricity is distributed by the municipality itself or by local commissions in the municipalities. It is understood that the accounting for all of the municipalities of the Severn System is done in accordance with the standard accounting system of the Commission, and the details for the various municipalities are given in the Annual Reports. WJF. p.19.

Parallel Operation of Severn, Eugenia, Wasdell's and Orillia Systems

Towards the middle of the year 1916, the load on the Big Chute plant exceeded its normal capacity due to the increase of the power demand of the municipalities on the Severn System and especially due to the requirements of the municipality of Orillia. This municipality had a contract with the Commission to supply the Orillia Water, Light and Power Commission with power, when such was required to supplement the supply from the Orillia Commission's own plant, situated at Ragged Rapids about ten miles up the Severn River from Big Chute.

To assist the Big Chute station it was decided to construct a tie line between it and the Wasdell's Falls station on the Wasdell's System, so that the excess power of the Wasdell's station, which was only lightly loaded, might be supplied to Orillia. A single circuit, 22,000-volt line of No. 1/0 aluminum, seven miles in length, was erected between the Wasdell's power house and the substation

Consultant was as a whole electrical-only and in all the municipalities the plurality in electrical of the municipality itself or by local consultations in the municipalities. It is noteworthy that the consulting firm all of the municipalities of the Lemon Jaffers is also in association with the electrical consulting firms of the Consultant, and the details for the various municipalities are given in the Annual Report.

Partial Operation of Service.

Towards the middle of the year 1916, the load on the old water plant reached the maximum capacity and in the interval of the year demand of the municipalities on the power during the winter was by the requirements of the municipality of Orillia. This municipality's contract with the Commission to supply the Orillia Water, Light and Power Commission with power, when such was required to maintain the supply from the Orillia Commission's own plant, started at Lemon Falls about the middle of the Power Flow from the Ottawa.

By making the old Orillia station in the Central, it became a site from Ottawa, it was the Central's Orillia station on the Central's system, to take the source from of the Central's station, which was only lightly loaded, right to supplying to Orillia. A single circuit, 22,000 volt line of 70, 1/0 circuits, were which is 16miles, was used to supply the Orillia Water, Light and Power Commission with power.

of the Orillia Commission located at Longford, north-east of Orillia. The tie line between the Wasdell's and Severn Systems was completed by utilizing the existing 22,000-volt lines of the Orillia Commission, which had already been in service for some years, from Longford to the Orillia switching station near Ragged Rapids and thence to the Big Chute plant.

The two generating stations at Big Chute and at Wasdell's Falls were placed in normal parallel operation on July 24th, 1916, and the Wasdell's station then supplied practically all of the Orillia load previously taken from the Big Chute station by the Orillia Commission. Two important objects were gained, the Wasdell's station was loaded to a point of economical operation and the load on the Big Chute station was reduced.

The power supply of the Severn System was further augmented in 1916 by the paralleling of the Eugenia Falls station with the Big Chute station. This was accomplished by the erection of a 22,000-volt tie line of No. 1/0 copper, twenty-four miles long, between the Eugenia Falls power house and the Collingwood distributing station on the Severn System. Power from the Eugenia System was first supplied to the Severn System on October 6th, 1916.

The Orillia Commission's power plant at Ragged Rapids on the Severn River about ten miles above Big Chute was put into service in 1901, but, on account of

of the Utility Commission issued at Langford, Surrey-
ed Utility. The 4th line between the Tassell's and Tyson
Estates was completed by utilizing the existing 30,000-
volt lines of the Utility Commission, which had already
been in service for some years, from Langford to the Utility
substation erection near Higgins Hall and thence to the new
steam plant.

The two generating stations at Big Stone can be
Tassell's Mills were placed in second parallel operation on
July 24th, 1926, and the Tassell's station then supplies
practically all of the Utility load previously taken from
the Big Stone station by the Utility Commission. Not in-
portant statistics were taken. The Tassell's station was
located in a point of economical operation and the load on
the Big Stone station was reduced.

The power supply at the Saxon System was
further augmented in 1928 by the installation at the
Tassell's Mills station of the Big Stone station. This
was accomplished by the erection of a 22,000-volt line
of 1/0 copper, twenty-four-mile long, between the
Tassell's Mills power house and the Utility's Alderton
station on the Saxon System. Power from the Tassell
System was first supplied on the Saxon System on October
4th, 1928.

The Utility Commission's power plant at Langford
Depot on the Tassell Stone Mills was built when the
Stone was put into service in 1921, but, on account of

unsatisfactory local conditions, had not been able to deliver full capacity continuously. The Orillia Commission therefore made arrangements with the Simcoe Railway and Power Company for power from the Big Chute plant to augment the supply from Ragged Rapids during certain periods. This contract was still in force when the Big Chute plant was purchased by the Power Commission. Later, the Orillia Commission decided to construct a new plant at Swift Rapids near Ragged Rapids where there was a satisfactory location and where a head of 47 feet was available instead of the 41 feet at Ragged Rapids. Towards the end of 1917, the new plant at Swift Rapids was ready for service and the old plant was abandoned. The Power Commission soon afterwards purchased from the Orillia Commission seven and one-half miles of 22,000-volt, single circuit, three-phase line of No. 2 aluminum conductor to form a tie line between the Big Chute plant and the new development at Swift Rapids.

Regular parallel operation of the Eugenia, Big Chute, Swift Rapids and Wasdell's plants was begun on June 1st, 1918, and has thereafter been continued, proving of great advantage to all the systems concerned.

The high head and the large local reservoir capacity of the Eugenia development make it unusually serviceable as a peak load plant. Off-peak power from the Severn and Wasdell's Systems which could not otherwise

be utilized has been and may be transferred to the Eugenia System, allowing the Eugenia plant, by operating at a variable load, to conserve the stored water and make it available to supply peak loads on the combined systems. The transfer of power from one system to another is therefore beneficial to all, and it is understood that book-keeping credits and debits as between the various systems concerned are kept in the books of the Commission. Up to October 31st, 1920, the electrical power delivered by one system to another was apparently charged for on the basis of $25.00 per horse-power. It is stated that in 1921, it was decided by the Power Commission that, beginning with 1921, the interchange of power between these systems would be at cost and not at a fixed rate.

The tie lines to adjacent systems and plants on adjacent systems making available to the Severn System power from the Orillia, Eugenia and Haddell's Systems therefore constitute an additional source of power for the Severn System.

The amount of continuous power available from the Eugenia System for the Severn System is now very small and practically none has been billed from Eugenia during the last three years. Nevertheless, the Severn System

be utilized but have not yet be implemented in the Nazarin Alpine, utilizing the Dugouin plant, by operating at a variable load, to conserve the stored water and make it available to supply peak loads on the combined systems. The transmission of power from one system to another in Europe has benefited/ed, and it is worthwhile that European people realize and learn to harness the various streams interwoven are kept in the hands of the Nationalist. By the Oslaw Act, 1910, the electrical power industries by an system to another was apparently engaged for on the basis of 30,000 per kilowatt. It is stated that in 1933, it was decided by the Power Commission that, beginning with 1941, the transmission of power between those systems would be at cost and not as a fixed rate.

The big lines to adjacent systems and plants on adjacent systems making available to the Swiss Alpine power from the Dutilli, Dugouin and Vandall's Alpine stations in additional amount of power for the Swiss system.

The income of electrical power available from the Dugouin dynamo for the Swiss Alpine is for very small and practically zero but have still from Dugouin during the last three years. Nevertheless, the Swiss system

makes use of the peak capacity of the Eugenia plant and the Eugenia System draws a considerable amount of off-peak power from the Severn System. WJF. p. 11, 12,13 & 14.

A map showing the generating station, transformer stations and transmission lines of the system forms the frontispiece of this report.

GENERAL ECONOMICS

Capital Investment

The initial expenditures on the Severn System were made in 1911, when the Commission constructed wood pole lines for the purpose of serving electric energy to the towns of Midland and Penetanguishene.

Under authority of an Order-in-Council, dated June 17th, 1914, the Commission purchased the Big Chute generating station on the Severn River together with its transmission lines and distributing stations from the Simcoe Railway and Power Company, Limited, for $475,000.00. The Order-in-Council provided for:

1. The taking over of the property, franchises, easements and leasehold rights covering the development and operation of the water-power known as the Big Chute, and located upon the Severn River in the townships of Machedash and Baxter in the Province of Ontario, and which are now held by the said Company.

2. The taking over of power development works and plant and appurtenant structures of the Big Chute.

3. The taking over of all transmission lines and sub-stations now owned by the said company.

4. The taking over of the power site at Port Severn now owned in fee simple by the said Company, together with any lands, riparian rights and privileges or easements connected therewith and necessary for the purpose of the power development except such lands therefrom as the Dominion Government may require for the Trent Valley Canal.

FEDERAL EXPENDITURE

Initial Investment

The initial expenditures on the Devils Canyon were made in 1921, when the Commission issued permits for the purpose of erecting electric energy on the rivers of Idaho and Pennsylvania.

Under authority of an order-in-council, dated June 17th, 1924, the Commission granted the City Power Corporation rights on the Devils River together with its transmission lines and distribution systems from the Devils Canyon and River Company, limited, for $475,000.00. The order-in-council provided for:

1. The taking over of the property, franchises, easements and licensed rights covering the development and operation of the water-power sites on the Devils Canyon, and located upon the Devils River in the Township of Dunbarton and Denton in the Province of Ontario, and which are now held by the said Company.

2. The taking over of power development works and plant and appurtenant structures of the City Power.

3. The taking over of all transmission lines and substations now owned by the said company.

4. The taking over of the power site at Port Denton now owned in fee simple by the said Company, together with any lands, riparian rights and privileges or easements necessary thereto and necessary for the purposes of the power development, except such lands in the Dunbarton Conservancy Area lying for the Devil Valley Road.

5. The taking over of such works, assets, easements, franchises, real property and rights, equipment and chattels, now held by the said Company as may be owned and controlled by them and necessary for the purposes of the Commission for the sum above named.

6. The authority to further develop the water powers at the Big Chute, and at Port Severn to full capacity when the necessity for doing so shall arise, and to purchase all necessary material and equipment in connection with such development. WJF. p.5.

The Commission acquired the properties, subject to the electrical power contracts of the Simcoe Railway and Power Company, with the Village of Victoria Harbour, The Victoria Harbour Lumber Company, the Town of Orillia, and the Marconi Telegraph Company of Canada and agreed to carry out the contracts in accordance with the terms thereof.

The properties acquired were valued by the Engineers of the Commission at $475,550.00, consisting of the following:

Cost of properties

Big Chute Generating Station			
Station and Equipment	$202,750.00		
Step-up Equipment	22,953.00		
Intangibles	124,011.00	$349,724.00	
Victoria Harbour Tap to Victoria Harbour		3,000.00	
Victoria Harbour Distributing Station		2,850.00	
Line Big Chute to Waubaushene, including towers		63,506.00	
Line Waubaushene to Victoria Harbour Tap		10,330.00	
Line Victoria Harbour Tap to Port McNicoll Tap		11,385.00	P.W.
Port McNicoll Tap to Midland		8,250.00	p.6.
Midland Station		21,355.00	
Victoria Harbour Distribution System		5,150.00	
		$475,550.00	

5. The taking over of such works, plants, machinery, fixtures, real property and rights, easements and obligations, now held by the said Company as may be found and ascertained by them and necessary for the purposes of the Commission for the aforesaid.

6. The authority to further develop the water powers on the Sly River, and to Port Harvey to full capacity when the necessity for doing so shall arise, and to purchase all necessary material and equipment in connection with such development.

The Commission acquired the properties, rights

to the electrical power resources of the Sinclair Sailing

and Power Company, with the villages of Tigerville Harvest,

the Victoria Harvey Lumber Company, the Town of Orillia,

and the Central Saskatchewan Company of Canada and proceed to

carry out the purposes in conformance with the terms thereof.

The properties acquired were valued by the Commissioners of the Commission at $[illegible], consisting of the following:

Cost of properties

Sly River Generating Station	
Station and Equipment	$[illegible]
Dam-on Equipment	[illegible]
Installed	[illegible]
Victoria Harvey Dam to Victoria Harvey	[illegible]
Victoria Harvey Distributing System	[illegible]
Line Sly River to Orillia, including Arena	[illegible]
Line Westbrooke to Victoria Harvey Dam	[illegible]
Line Victoria Harvey Dam to Port Bellamy Dam	[illegible]
Port Bellamy Dam to Kitimat	[illegible]
Kitimat Station	[illegible]
Victoria Harvey Distribution System	[illegible]
	$[illegible]

The item of intangibles shown above apparently includes the Port Severn Site, the leasehold rights at Big Chute and the unexpired power contracts and franchises then held by the company. WJF. p.6.

Since the acquisition of the above named properties, the Commission has installed an additional unit in the Big Chute generating plant, extended the transmission lines and added other equipment so that at October 31st, 1921, the investment in plant, equipment, etc., of the Severn System amounted to $1,406,847 made up as follows:

Power Development	$652,252	
Transmission Lines	569,977	
Distribution Stations	184,564	P.W.
Rural Lines	53	p.10.
	$1,406,847	

The principal expenditures on the system since 1917 are as follows:

Balance October 31st, 1917	$868,347	
Add - Expenditures in connection with:		
The installation of an additional unit at the Big Chute generating station	272,385	
The construction of a road between the Big Chute generating station and the Canadian Pacific Railway and the erection and equipment of a machine shop	15,878	P.W. p.10
The construction of wood pole line to serve Allliston, Cookstown, Beeton, Tottenham and Bradford	118,944	
The purchase of the transmission lines between Big Chute and Swift Rapids from the town of Orillia	20,000	
Carried Forward	$1,295,554	

The item of Instruction cases data cyclopedia, including the Jack Barton Glee; the Jacksonville Kiddie Band; and the Washington Power Institute and Electrical Exposition Band, will be paid by the company.

Since the negotiation of the above bonus provision, the Commission has instituted an investigation in Washington City Electric Manufacturing Plant, covering the Washington line and added other employees as shown in Exhibit XIV. 1921, the investment is plant, equipment, etc., of the Sparks Grove company is $1,604,647 made up as follows:

Power Generators	$420,305
Transmission Lines	308,877
Distribution Systems	376,054
Bare Lines	22
	$1,404,647

The principal expenditures on the system since 1924 are as follows:

Indiana Central Gas, 1927	$428,847
LAC - Incandescence in telephoning wire; the installation of an additional wire at the City Stone Cross Wiring station	376,250
The construction of a road between the City Cross Generating station and the Pleasant Valley Railway and the construction of a machine shop	18,072
Certain Electric Railway and the construction of road gate line on Pleasant Valley, Cranston, Lewis, Berry Library, Cranston, Lewis, Portsmouth and Smithfield	116,864
The purchase of the transmission line from the town of Smithfield	22,000
Carried Forward	$1,202,033

Carried Forward	$1,295,554	
Replacing the original conductor wire with aluminum cable on the Big Chute to Waubaushene line	17,643	
Expenditures on distribution stations at -		
Collingwood	22,451	P.W.
Port McNicoll	12,153	p.10.
Midland	12,637	
Bradford	11,174	
Sundry other items	35,235	
Total -	$1,406,847	

The following table shows the capital costs per rated horse-power for each of the years from 1914 to 1921:

	Fiscal year ending October 31st			
	1914	1915	1916	1917
Power Development	$120.50	$120.50	$120.60	$124.60
Transmission Lines	104.40	109.10	115.70	140.80
Transforming & Distributing Stations	13.80	23.70	27.50	34.00
Rural Lines	-	-	-	-
	$238.70	$253.30	$263.80	$299.40

WJF - p. 31.

	Fiscal year ending October 31st			
	1918	1919	1920	1921
Power Development	$190.30	$137.80	$141.10	$141.80
Transmission Lines	181.70	119.00	120.20	123.90
Transforming & Distributing Stations	57.60	36.60	39.00	40.10
Rural Lines	-	-	-	.10
	$429.60	$293.40	$300.30	$305.90

In respect of the capital costs per horse-power, our Consulting Engineer states:

> "The capital costs of the Big Chute generating plant show reasonable construction costs, and now stand at about $142 per horse-power." WJP. p.56

Reserve for Renewals

The balance in the reserve for renewals in respect of properties of the Severn System amounted at October 31st, 1921, to $227,347, made up as follows:

Period	Provision	Interest	Together
From 1912 to October 31, 1916	$54,158	$2,055	$56,213
Fiscal year ending October 31st, 1917	20,991	2,241	23,232
1918	24,576	3,178	27,754
1919	34,930	4,288	39,218
1920	37,883	5,857	43,740
1921	37,905	7,606	45,511
Together	$210,443	$25,225	$235,668
Miscellaneous deductions			8,321
Total at October 31st, 1921			$227,347

WJP. p.43

Additions to the reserve for renewals are provided through the inclusion in the cost of power, of an annual charge of 2.75% of the depreciable capital, together with interest at the rate of 4% per annum on the balance in the reserve account.

The annual rate of 2.75% was determined by a reclassification of the properties of the system as shown by

It rested at the capital years for Darlington,

our Commissioner Regulator stations.

"The capital years at its big Class generating
plant were reasonably straightforward costs, and
the plant at about £182 per kilowatt-power."

Future for Ontario

The balance in the reserve for renewals is year-
part of investments at the Queen Street counsel at October
31st, 1923, is £117,247, which is as follows:

Period	Provision	Interest	Together
From 1912 to October 31,1916 (Three year under review)	£34,142	£1,102	£34,244
Six, 1914	£2,341	£1,341	£3,682
1918	£4,277	£2,170	£7,777
1919	£6,194	£4,889	£11,214
1920	£7,225	£8,027	£15,252
1921	£12,200	£7,202	£19,411
Together	£68,480	£25,330	£93,810
Disposition reserves			£ 1,021
Total of October 31st, 1923			£117,247

Addition to the sinking fund reserve are invested
through the Insurance in the name of Queen, at an annual conver-
of 4.72% of the depreciable capital, together with interest
at the rate of 4½ per annum on the balance in the sinking
account.

The annual rate of 4.72% was determined by a pre-
classification of the properties of the Commission which is equal to

the books at October 31st, 1916.

The engineering department of the Commission has prepared an analysis of the Capital Investment Account of the Severn System, as of recent date, which is to be used as a basis for a reduction of the renewal rate, and a consequent retroactive revision of the reserve account for a period of years.

Should the Commission reduce the renewal rate, it will have the effect of building up the reserve at a slower rate in the future and consequently reduce the total annual cost of power, not only in the future, but also during the period that the reduced rate is made retroactive.

It is understood that the Commission spend sufficient money on maintenance to keep the system in a condition to operate economically which is considered to be about seventy-five per cent. as good as its original new condition. On this basis, our Consulting Engineer states that the renewal reserve should be studied in connection with 25% of the capital invested in the system and expresses the opinion that the total accumulations of the fund as applicable to 25% of the total depreciable capital is somewhat larger than is necessary.

the basis of 1939-40 dollars, 1944.

The engineering department of the Commission has prepared an analysis of the capital investment requirements of the Alberta Petroleum, as of recent date, which is to be used as a basis for a revaluation of the present rate, and a reasonable retroactive revision of the reserve account for a period of years.

Should the Commission refuse the requested rate, it will deny the effect of building up the reserve as a clear rate in the future and consequently reduce the total annual rate of return, not only in the future, but also during the period that the reduced rate is made retroactive.

It is contended that the Commission spend sufficient money on maintenance to keep the system in a condition of operate economically which is considered to be about average-like per cent, as good as the original new condition. On this basis, the Consulting Engineer states that the reasonable reserve should be created in conjunction with 25% of the capital invested in the system and expresses the opinion that the total accumulations of the fund as applicable to 25% of the total depreciable capital is somewhat larger than is necessary.

Reserve for Sinking Fund

At October 31st, 1921, the balance in the reserve for sinking fund for the municipalities and companies on the Severn System amounted to $43,614.47 and $16,346.75 respectively making a total of $59,961.22.

The basis for ascertaining the amount of the reserve for sinking fund each year is, for the Severn System, the capital cost of the power development, transformer stations, transmission lines, etc., completed and in operation. The method used by the Commission in calculating the amount of the reserve is as follows:-

The annual sum sufficient to form in thirty years, with interest at four per cent. per annum, the amount of capital invested. This sum is equivalent to an annual rate of 1.8% of the principal invested.

The capital investment of the respective sections of the lines and stations is distributed to the municipalities and others receiving power therefrom in the proportion that the horse-power furnished each customer bears to the aggregate horse-power furnished all customers on these sections of the lines.

The rate of 1.8% is applied to the principal so determined, proper allowance being made for any units of plant in operation less than a year.

The portion of the reserve, determined as outlined in the foregoing, applicable to municipalities in operation for a period of six years or longer, is included each fiscal year in the cost of power furnished the respective municipalities. For such municipalities as may not have been in operation for that period the sum apportioned against the municipality in its first year and deferred, is included in the cost of power in sixth year of operations, etc.

Reserve for Sinking Fund

At October 31st, 1923, the liabilities in the reserve for sinking fund for the municipalities and companies on the Niagara System amounted to $48,624,67 and $38,848,72 respectively, making a total of $87,473,39.

The basis for apportioning the amount of the reserve for sinking fund each year is, for the Niagara System, the capital cost of the power development, transformer stations, transmission lines, etc., completed and in operation. The method used by the Commission in calculating the amount of the reserve is as follows:-

The annual sum payable is fixed in sinking fund, with interest at four per cent, per annum, the amount of capital invested. This sum is equivalent to an annual rate of 1.89 of the principal invested.

The capital investment of the respective municipalities and companies is distributed in the municipalities and others receiving power therefrom in the proportion that the horse-power furnished each structure bears to the aggregate horse-power furnished all structures on these municipalities at the time.

The rate of 1.89 is applied to the principal in determining proper allowance being made for any rate of place in operation less than a year.

The portion of the reserve, determined as stated in the foregoing, applicable to municipalities in operation for a period of six years or longer, is included each fiscal year in the cost of power furnished the respective municipalities. The sums municipalities as may not have been in operation for that period the sum apportioned against the municipality in the first year and thereafter, is included in the cost of power in sixth year of operation, etc.

The above shows the aggregate amount of the sinking fund collectible at October 31st, 1921, from eleven municipalities which have taken power for six years, or longer, the initial charge being made in the sixth year's power cost. The sinking fund charges deferred at October 31st, 1921, amounted to $44,741.47, representing deferments, as permitted by the Act, for a period of from two to four years in respect of sixteen municipalities. In this connection it may be stated that, of the seventeen municipalities in the Severn System as at October 31st, 1921, one municipality, Penetanguishene, had paid all charges against it, while six municipalities had made no payments into the sinking fund as the five years' period had not elapsed. P.W. p.22

Reserve for Contingencies

The balance in the reserve for contingencies as at October 31st, 1921, amounted to $7,128.08. This reserve has been established by the Commission for the purpose of providing for special losses or expenses not arising at regular intervals and not wholly applicable to the period in which incurred. The reserve for contingencies is provided by means of - P.W. p.23 & 24.

(a) An annual charge of 25¢ per horse-power on average power supplied each year to the municipalities comprising the system and private companies.

(b) Credit representing profits realized on sale of power to private companies.

(c) Profit from sale of miscellaneous equipment.

The area which the applicants assert of the electric fuel utilities as Jan., 1921, from which municipalities which have been paid for six years, is larger, the initial charge being made in the single year's power rent. The electric fuel charges returned as January 31st, 1921, amounted to $46,741.67, representing industrials, as provided by the Act, for a period of from one to one years in respect of without municipalities. In this connection it may be stated that, at the maximum municipalities in the Province Ontario as at October 31st, 1921, are municipality, Powerhouse, the paid all charges against it, while six municipalities had made no payments into the electric fuel as the five years' period has not elapsed.

<u>Payments for distribution</u>

The payment in the power-for consumption as at October 31st, 1921, amounted to $7,121.00. This reserve has been established by the commission for the purpose of providing the capital funds to enable municipal or rural lines and use electric appliances to the period in which interest. The reserve for distribution is provided by means of -

(a) An annual charge of $20 per horse-power in excess power supplied each year to the municipalities exclusive the urban and private companies.

(b) Profit representing profits realized on sale of power to private consumers.

(c) Profit from sale of miscellaneous equipment.

(d) Interest at four per cent. per annum.

Having in mind the heavy losses which might be occasioned through catastrophe, our Consulting Engineer points out that the total amount at the credit of this fund, namely about $7,128 should be augmented by increasing the annual allowance for contingencies, and when a reserve of say $20,000 or $30,000 will have been built up, the rates can be re-adjusted to suit the conditions found after several further years of operation. WJP. p.46

Accounts with Municipalities

Accounts with municipalities are divided by the Commission in the main as follows:-

(a) Power Accounts Receivable.

(b) Due by or to municipalities in respect of the cost of power furnished them as determined by the Power Commission Act.

(a) Power Accounts Receivable

The balance in the Power Accounts Receivable at October 31st, 1921, amounted to $43,621. These accounts represent unpaid balances in respect of interim power bills which are paid currently by the municipalities.

(b) Due by Municipalities in Respect of the Cost of Power

At the close of each fiscal year, the interim power bills rendered monthly are adjusted to meet the operating costs of the system, as provided by the Power Commission Act.

(d) Interest at four per cent, yet unknown.

Bearing in mind the heavy losses which might be sustained through retrenchment, and considering budgetary policy and that the total amount of the credit or this item, namely about $7,125 would be augmented by increasing the annual allowance for contingencies, and when a payment of any $50,000 or $20,000 will have been built up, the rates can be readjusted so as to the consumers from other general revenue purpose of operation.

Agreements with Municipalities

Agreements with municipalities are dictated by the Commission in the main as follows:-

(a) Power Agreement Investigation.

(b) Due by or to municipalities in respect of the cost of power furnished from an hydro-electrical by the Power Commission Act.

(c) Power Agreement Execution

The balance in the Power Agreement Investigation at March 31st, 1921, amounted to $62,021. There accounts payment usually balances in respect of hydro power with which are due to be repaid by the municipalities.

(b) Due by Municipalities
In Respect of the Cost of Power

In the minds of such direct power, the interest power bills wherever possible are adjusted so that the expenditure of the system, as provided by the Power Commission Act.

It does not appear to be the practice of the municipalities to pay in cash these additional charges, but instead the Commission increases the interim rates in subsequent periods and thereby reduces the accumulated deficits of prior periods.

Regarding the payment of these deficits, section 23a of the Power Commission Act provides that:

> "The Commission may from time to time during the first three years after any municipality shall first begin to take power from the Commission extend the time for payment of the sums payable by any municipality."

Some of the following balances extend back to the first year of operation and beyond the three year limit authorized by the Act. In September, 1922, when these accounts were examined by our Auditors, six of the seventeen municipalities were in default in the payment of their power bills. The following is a list of the balances due by or to municipalities of the Severn System as at October 31st, 1921:

Municipality	Debit	Credit	
Alliston	$7,952.10	-	
Barrie	4,201.41	-	
Beeton	4,284.80	-	
Bradford	8,470.66	-	
Coldwater	1,842.49	-	
Collingwood	7,572.28	-	
Cookstown	1,687.50	-	
Creemore	-	1,466.34	
Elmvale	-	523.49	
Midland	12,462.64	-	
Penetanguishene	636.91	-	
Port McNicoll	-	231.49	
Stayner	718.56	-	P.W.
Thornton	1,864.39	-	Ex.
Tottenham	4,519.96	-	IV.
Victoria Harbour	-	484.22	
Waubaushene	191.78	-	
Totals	$56,175.48	$2,705.54	

It might be well to mention that Midland paid its account in full on September 27th, 1922.

It might be well to point out in connection with these accounts due by municipalities, that, in view of the fact that consideration is now being given to the reduction, retroactive over a period of years, of the renewal rates, these accounts will be correspondingly reduced upon the apportionment of the amount of the adjustment, provided the same practice is followed as for other systems, where the municipalities received credit.

Municipality	Debit	Credit
Allison	97,922.12	-
Beryle	4,207.83	-
Bowen	4,245.27	-
Crawford	6,477.63	-
Holmquist	1,342.40	-
Whittemore	7,573.32	-
Cookston	1,527.81	-
Dressmore	-	1,522.74
Murvale	-	302.69
Midland	12,424.44	-
Pearsonville	225.21	-
Port Halifax	-	223.49
Sharpway	714.56	-
Fairview	1,664.30	-
Tretheyne	4,312.94	-
Vigfusfjo Junction	-	445.62
Vanderbrom	193.72	-
T o t a l s	52,172.62	52,772.54

It might be said to satisfy this distrust that it is unusual in full on computer after 1980.

It might be said to qualify the in consumption with state consumption due by municipalities, that, in view of the fact that amalgamations is now being driven in the province, Dartmouthfjo were a period of years, at the second phase, these accounts will be correspondingly smaller than the expenditures of the manner at the beginning. Putting the same practice is figured as the other systems, where the municipalities received overall.

Results of Operation

Power is supplied to the municipalities on the Severn System on a cost basis as outlined in the Power Commission Act. The cost of such power includes:

1. Operating and maintenance expenses.

2. Interest on the monies invested in the works of the system.

3. Provision for the renewal of the works.

4. Sinking fund on a thirty-year basis to repay the investment in the system.

Power is also supplied to private companies at fixed rates which will be dealt with hereinafter.

The operating account of the system for the four years ending October 31st, 1921, is as follows:

P.W.
Ex. I.

Particulars	Year Ending October 31st, 1918	1919	1920	1921
Revenue				
Municipalities	$108,980.22	$171,324.01	$165,947.31	$183,912.77
Private Companies	38,852.73	32,068.01	25,345.64	28,218.45
Together	$147,832.95	$203,392.02	$191,292.95	$212,131.22
Operating Expenses & Fixed Charges:				
Power purchased	$43,666.87	$42,470.19	$12,852.91	$18,781.86
Operating Expenses	11,390.51	15,498.06	15,467.26	20,068.15
Maintenance "	19,405.35	22,673.92	18,178.15	25,263.99
Overhead "	7,812.02	18,604.24	26,294.24	25,886.81
Interest	35,746.43	55,041.16	62,755.00	62,716.23
Provision for renewals	24,575.67	34,930.22	37,883.05	37,905.42
Provision for Sinking Fund	3,758.43	12,716.88	16,439.21	19,046.04
Provision for Contingencies	1,477.67	1,457.55	1,423.13	1,360.22
Total Expenses	$147,832.95	$203,392.02	$191,292.95	$211,028.72
Balance transferred to Contingencies	-	-	-	$ 1,102.50
Total horse-power Billed	5910.6	5829.4	5692.7	W.J.F. p.27 5440.8
Cost per horse-power Billed	$25.04	$34.91	$33.60	$38.78 W.J.F. p.50

It should be mentioned that the profit arising from the sale of power to private companies at fixed rates from the commencement of operations to October 31st, 1920, has been credited to the municipalities in proportion to the amounts of maintenance costs of the system paid by them

27.
Exc. 1.

Participants	1920	1921	Year Ending March 31st, 1922	1923
Receipts				
Municipalities	£172,000.22	£191,140.01	£180,347.02	£180,412.77
Private Companies	24,154.17	32,242.01	32,316.04	40,412.22
Tapwise	£197,000.39	£202,312.02	£211,207.12	£221,121.12
Operating Expenses				
A Fixed Charges				
Power purchase	£48,212.07	£49,470.12	£52,202.21	£52,141.14
Operating Expenses	31,302.32	32,242.14	32,427.12	32,540.12
Maintenance "	19,421.22	23,470.20	19,172.12	22,220.22
Stores "	3,212.02	12,172.12	13,172.12	20,224.21
Labour "	21,142.42	22,241.34	21,142.22	22,112.22
Provision for Renewals	24,172.47	24,202.22	27,202.02	27,000.12
Provision for Sinking Fund	3,140.42	12,172.22	12,202.21	12,242.12
Provision for Contingencies	1,472.27	1,427.27	1,422.12	1,242.22
Total expenses	£197,222.12	£202,242.12	£221,222.22	£211,242.12
Balance transferred to Undertakings	-	-	-	£ 1,142.22
Total Horse-power sold	2212.4	2222.4	2227.7	2232.2
Over and Above-power sold	122.22	124.21	(22.22)	122.22

It should be mentioned that the profits arising the amount of maintenance costs of the steam plit at time has been credited in the municipalities in proportion to their number of operations in October 1922, from the rate of power to private consumers at fixed rates

It should be mentioned that the profits arising

while in the fiscal year ending October 31st, 1921, the profits have been transferred to the contingency reserve.

The profits resulting from the sale of power to private companies from the inception of the system to October 31st, 1921, are as follows:

Net profit earned:

To October 31st, 1917	$42,754	
Fiscal year ending October 31st, 1918	10,630	
Fiscal year ending October 31st, 1919	635	
Fiscal year ending October 31st, 1920	2,697	P.W.
Fiscal year ending October 31st, 1921	1,102	p.13
Total -	$59,018	

which amount has been disposed of as follows:

Credit to municipalities as a reduction in the cost of power supplied to them	$57,916
Credited to contingency reserve	1,102
Total as above -	$59,018

It will be seen from the foregoing operating account that the municipalities were charged with the cost of power and distribution thereof and with that proportion of fixed charges which pertains to the power supplied; also, as just mentioned, that the municipalities obtained a measure of relief by the application of net profit from the sale of power to private companies.

The revenue from power sold to private companies, and the average rate per horse-power, for each of the four years ending October 31st, 1921, is given on the following page (cents omitted):

while in the fiscal year ending March 31st, 1921, the generation have been transferred to the municipal systems.

The profits resulting from the sale of power to private companies from the inception of the system to October 31st, 1921, are as follows:

To municipal systems:	
To December 31st, 1917	$44,414
Fiscal year ending March 31st, 1918	12,320
Fiscal year ending March 31st, 1919	388
Fiscal year ending December 31st, 1920	1,047
Fiscal year ending December 31st, 1921	1,212
T o t a l	$59,008
Profit resulting from sale of power to private companies:	
In the cost of power supplied to them	$27,914
Profits on installation revenue	1,110
Total as above -	$87,912

It will be seen from the foregoing operating results that the municipalities were charged with the cost of power and distribution income plus this percentage of time whereas which pertains to the power supplied also, as just mentioned, that the municipalities obtained a source of relief by the application of the profits from the sale of power to private companies.

The revenue from power sold to private companies, being the surplus into the Province, for each of the four years ending October 31st, 1921, is given on the following page (omits omitted):

	Years ending October 31st, 1918		1919		1920		1921	
	per h.p.	Amount	per h.p.	Amount	per h.p.	Amount	per h.p.	Amount
Camp Borden	$35.00	$10,091	$35.00	$ 6,120	$35.00	$ 1,806		$ 1,000
Air Board							$35.00	2,058
G.P.R.Elevator	27.96	22,766	28.05	25,614	27.77	25,345	28.48	24,986
Orillia	25.00	5,996						
Department of Railways & Canals	-	-	14.72	134	16.46	194	15.42	194
Total		$38,853		$32,068		$25,345		$28,218

F.W. p.14.

Up to the close of the fiscal year ending October 31st, 1920, power was sold to Camp Borden under contract on the basis of a flat rate of $35.00 per horse-power. This contract was assumed by the Air Board (which occupies a part of the Camp) as from the above date and a new agreement was made with the Department of Militia & Defence (Camp Borden) whereby power was to be delivered to it on the basis of a yearly rental of $1,000 plus the maintenance and operating expenses of the transmission line, substation building and equipment, belonging to the Department of Militia & Defence, and used for the delivery of such power. These operating and maintenance expenses amounted to $1,184.38 for the year ending October 31st, 1921, and have been included in the accounts of the Commission for that year. This amount was paid by the Department on April 6th, 1922.

From the foregoing operating account, it will be noted that the average cost per horse-power billed

Years ending December 31st.

	1919	1920	1921
	per cent.	per cent.	per cent.
Deep Water	[illegible]	[illegible]	[illegible]
Air Trans.			
G.T.R. Steamer	[illegible]	[illegible]	[illegible]
Utility	[illegible]		
Departments of Railways & Canals	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]

Up to the close of the fiscal year ending December 31st, 1922, power was held on deep water vessels leased on the basis of a flat rate of [illegible] per horse-power. This negotiated was assumed by the air force (which occupies a part of the dock) we from the above rate not a new agreement was made with the Department of Utility & Defence (long haulage) whereby power was to be delivered to it on the basis of a yearly rental of $1,000 plus the maintenance and operating expenses of the vessel-plus interest, substantial repairs and equipment, applying to the Department of Utility & Defence, and that the delivery of work power. These expenditures and maintenance expenses amounted to $1,104.00 for the year ending December 31st, 1921. Are have been included in the accounts of the Consolidated for that year. This amount was paid by the Department as itself 6th, 1922.

Even the charging operating account, it will be noted that the revenue from the Deep-Water Utility

increased from $25.04 in 1918 to $38.78 in 1921, or approximately 55%. The following table showing the detailed costs illustrates in what respects and to what extents the operating costs and fixed charges have increased:

	Fiscal Year ending October 31				
	1918	1919	1920	1921	
Power Purchased	$7.47	$7.32	$2.26	$3.45	
Operating	1.92	2.66	2.72	3.68	
Maintenance	3.23	3.62	3.11	4.54	
Overhead & General Expense	1.36	3.45	4.70	4.86	WJF.
Interest	6.04	9.44	11.01	11.52	p.50
Renewals	4.15	5.99	5.66	6.98	
Sinking Fund	.61	2.18	2.89	3.80	
Contingencies	.24	.25	.25	.26	
T o t a l -	$25.04	$34.91	$33.60	$38.78	

The variations shown above are due to some extent to the decreased quantity of power purchased from other systems and the increased amount generated at the Big Chute generating station. The increase in sinking fund is attributable to the additional number of municipalities paying sinking fund in the six years' power costs.

The following table shows the actual horse-power loads taken by the municipalities on the Severn System for the full year periods of operation. It might be well to mention that, with a few exceptions, the minimum loads were taken in

increased from $28.04 in 1918 to $28.78 in 1921, or approximately 20%. The following table sets forth the major items illustrating the duty rendered and showing actual the operating costs and final charges for the investment.

	Final Year ending December 31			
	1921	1919	1920	1921
Error Purchase	37.87	37.20	28.22	25.26
Operating	1.92	2.12	2.72	2.88
Maintenance	3.22	3.42	3.11	4.24
Purchase & Charges				
Depreciation	1.24	0.42	1.25	1.42
Interest	6.04	7.84	11.21	11.21
Insurance	7.10	8.97	2.88	6.90
Sinking Fund	1.12	2.12	3.99	2.02
Institutions	.24	.12	.22	.24
T o t a l -	$22.04	$23.21	$23.20	$24.72

The variations shown above are due in some extent to the increased quantity of power generated from other sources and the increased amount generated at the old Shore generating station. The increase in sinking fund is attributable to the additional number of municipalities paying sinking fund in the six years' power years.

The following table shows the actual horse-power loads taken by the municipalities on the Ontario System for the fall year periods of operation. It might be well to mention that, with a few exceptions, the minimum loads were taken in

the early years of operation, and the maximum loads have been taken in the more recent years.

Municipality	Date Power was First taken	Yearly Minimum Load H.P.	Yearly Maximum Load H.P.	Yearly Average Load H.P.	
Alliston	1918	96.5	123.3	120.6	
Barrie	1913	309.1	788.5	502.2	
Beeton	1918	87.5	91.4	89.6	
Bradford	1918	28.9	53.0	41.0	
Coldwater	1913	31.1	67.9	43.3	
Collingwood	1913	302.6	1,831.5	1,017.1	
Cookstown	1918	52.7	61.1	57.1	
Creemore	1915	42.0	46.2	45.3	
Elmvale	1913	31.4	150.8	90.3	
Midland	1913	300.3	1,376.2	844.1	
Penetanguishene	1913	233.0	759.3	503.4	P.W.
Port McNicoll	1915	20.0	37.7	26.4	Ex.
Stayner	1913	51.0	120.0	85.2	I.
Thornton	1919	11.0	12.3	11.7	
Tottenham	1918	28.4	35.2	31.4	
Victoria Harbour	1914	27.3	48.9	34.8	
Waubaushene	1915	18.3	24.8	21.2	

The actual costs per horse-power to the municipalities on the Severn System are shown by the following table:

the early years of operation, and the problems these have taken in the more recent years.

Availability	Data Power Max Total Demand	Yearly Minimum Load %	Yearly Maximum Load %	Total Average Load %
Alicante	1916	16.8	142.4	100.1
Barcelona	1911	30.1	110.0	100.1
Bilbao	1910	47.1	71.4	63.1
Brussels	1913	38.7	63.9	61.0
Chicago	1910	31.1	67.7	63.8
Dallas	1911	225.1	1,000.1	1,117.1
Dresden	1910	46.7	61.1	57.1
Dresden	1911	43.0	65.0	60.0
Essen	1910	33.6	130.0	105.0
Milano	1910	249.0	1,070.0	864.1
Montevideo	1911	280.0	720.0	600.0
Port Sudan	1910	41.0	97.7	84.0
Prague	1910	81.0	151.0	84.1
Toronto	1910	13.7	73.0	64.7
Valencia	1910	32.4	72.0	73.6
Wilkes Barre	1910	47.3	63.3	54.6
Zaragoza	1910	32.0	54.0	41.1

The usual error for inter-power to the

availabilities of the various Systems are shown by the

following table:

Municipality	Yearly Minimum Actual Cost per H.P.	Yearly Maximum Actual Cost per H.P.	Yearly Average Actual Cost per H.P.	
Allisten	$64.95	$72.02	$67.64	
Barrie	21.14	37.75	29.15	
Beeton	76.34	82.24	79.07	
Bradford	112.59	158.11	130.59	
Coldwater	28.22	51.46	40.49	
Collingwood	21.08	49.83	30.13	
Cookstown	50.83	57.05	54.82	
Creemore	53.18	75.13	65.51	P.U.
Elmvale	24.18	49.05	32.60	Ex. I.
Midland	17.50	30.01	23.72	
Penetanguishene	17.57	31.39	26.12	
Port McNicoll	39.11	60.39	47.94	
Stayner	27.58	51.32	38.35	
Thornton	105.90	116.25	111.34	
Tottenham	[illegible]	121.91	117.72	
Victoria Harbour	[illegible]	60.74	46.44	
Waubaushene	19.02	53.18	35.60	

The following table is a comparison of the estimates submitted to the municipalities on the Severn System with the average actual horse-power loads taken by them together with the average actual cost per horse-power:

Commodity	Imports Liquid Fuel per Ton.	Imports Total Fuel per Ton.	Imports Average Price per Ton.
Alfalfa	[illegible]	[illegible]	[illegible]
Barrels	[illegible]	[illegible]	[illegible]
Beans	[illegible]	[illegible]	[illegible]
Bonafous	[illegible]	[illegible]	[illegible]
Cabbage	[illegible]	[illegible]	[illegible]
Cellulose	[illegible]	[illegible]	[illegible]
Chairs	[illegible]	[illegible]	[illegible]
Coffee	[illegible]	[illegible]	[illegible]
Cotton	[illegible]	[illegible]	[illegible]
Eggs	[illegible]	[illegible]	[illegible]
Fish	[illegible]	[illegible]	[illegible]
Fruit	[illegible]	[illegible]	[illegible]
Hides	[illegible]	[illegible]	[illegible]
Machinery	[illegible]	[illegible]	[illegible]
Potatoes	[illegible]	[illegible]	[illegible]
Rice	[illegible]	[illegible]	[illegible]
Sugar	[illegible]	[illegible]	[illegible]
Tobacco	[illegible]	[illegible]	[illegible]
Tractors	[illegible]	[illegible]	[illegible]
Vehicles	[illegible]	[illegible]	[illegible]
Wheat	[illegible]	[illegible]	[illegible]
Wheat in Barrels	[illegible]	[illegible]	[illegible]
Yarns	[illegible]	[illegible]	[illegible]
Yeast	[illegible]	[illegible]	[illegible]

The principal table is a comparison of the importations with the exports with the average price per ton-pound. Imports known by direct entries appear in the principal table on the foreign-trade sheets.

The principal table is a comparison of the importations with the exports with the average price per ton-pound.

Municipality	Estimates as submitted by the Hydro-Electric Power Commission: Date Submitted	Estimated Loads	Estimated Cost per h.p.	Average Actual Load H.P.	Average Actual Cost per H.P.
Alliston	May 11, 1916	250	$56.78	120.6	$67.64
	Jan.23, 1917		35.00x		
Barrie	Apr.23, 1912	(500	40.15	502.2	29.15
		(700	33.71		
		(800	32.42		
		(900	30.97		
Beeton	May 11,1916	125	47.10	89.6	79.07
	July 12,1917	125	44.27		
Bradford		none	none	41.0	130.59
Coldwater	Apr. 23,1912	200	30.58	45.3	40.49
		300	28.50		
Collingwood	May 18,1912	700	33.97	1,017.1	30.13
Cookstown	May 23,1917	75	34.00	37.1	54.82
Creemore	Dec. 8,1913	75	54.13	45.3	65.51
Elmvale	July 12,1911	100	75.50	90.3	32.60
	June 5,1912	150	31.00		
Midland		none	none	844.1	23.72
Penetanguishene	Feb. 15,1911	400	19.00	503.4	26.12
Port McNicoll	Oct. 1,1913	25	34.00	26.4	47.94
		50	26.00		
Stayner	Apr. 26,1912	(150	35.74	85.2	38.35
		(200	34.59		
Thornton	Aug. 11,1917	25	37.00	11.7	111.34
	June 1,1918	25	48.00		
Tottenham	May 11,1916	100	52.26	31.4	117.72
	June 27,1917	-	50.45		
Victoria Harbour	June 28,1911	50	40.16	34.8	46.44
		75	33.11		
		100	29.58		
Waubaushene	Oct. 1,1913	50	29.75	21.2	35.30

x - Approximately

P.W. Ex.I

From the above, two conclusions may be deduced in respect of the majority of municipalities:

1.- That the estimated loads have never been realised.

2.- That the actual costs exceed the estimated costs.

Municipality	Date Publication	Tentative Estimate	Estimate [illegible]	Actual Land	Actual Date Pay.
		Estimate on valuation of land Ecole-Chapelle Chemin [illegible]			
Alstrom	Dec. 12, 1912	630	504.46	340.4	147.64
	Jan. 21, 1913		19.[illegible]		
Barre	Apr. 22, 1913	400	42.22	352.3	58.22
		750	30.71		
		400	23.63		
		300	26.47		
Dexter	Dec. 31, 1912	230	47.32	64.4	73.07
	Mar. 12, 1917	140	46.37		
Brandon		[illegible]	[illegible]	43.7	140.22
Hawkshaw	Apr. 20, 1913	400	30.88	42.3	46.49
		800	38.30		
Hallingford	Mar. 18, 1913	700	38.47	1,017.4	80.73
Halifaxton	Mar. 20, 1917	72	56.00	37.3	35.03
Cranmore	Nov. 8, 1913	72	34.12	46.3	63.32
Clayville	July 23, 1911	100	71.80	64.5	42.40
	Feb. 8, 1912	120	34.80		
Sidland		[illegible]	[illegible]	321.3	42.24
Tomkinsville	Dec. 2, 1911	400	13.40	403.4	24.13
Port Hilliard	Nov. 3, 1913	24	34.83	34.4	47.74
		24	30.00		
Harvey	Apr. 20, 1913	140	23.74	63.5	58.30
		280	34.86		
Thornton	Aug. 13, 1917	72	37.02	33.7	111.38
	Jan. 1, 1918	80	68.00		
Cottagetown	Apr. 17, 1912	100	82.26	81.4	117.74
	Dec. 27, 1917	-	40.40		
Tiverton					
Barrow	June 20, 1911	30	40.36	33.3	42.44
		70	33.13		
		190	27.80		
Washington	Nov. 1, 1913	30	27.72	23.3	32.42
2 - Approximately					37.4	32.1

It is probable that the Engineers of the Commission have some explanation of these variations as there has been a marked change in economic conditions since the inception of the system.

The operation of tie lines commenced in 1916, connecting the Wasdell's System with the Severn System and the latter with the Eugenia System. Up to October 31st, 1920, the electrical power delivered by one system to another was charged for on the basis of $25.00 per horse-power. In 1921, it was decided by the Commission that, beginning with that year, the interchange of power between these systems would be at cost and not on the $25.00 rate. With reference to the price to be paid, by the system receiving power, to the system supplying power, the Power Commission Act provides as follows:

23c The Commission shall have the right wherever physical connections may be made between any of the systems operating under this Act to make the necessary connections so as to divert power from any one system to any other system, and the means of such connection, and the price to be paid by the system receiving such power to the system supplying such power shall in all cases be determined by the Commission, and the cost of the power so taken by any one system from any other shall be dealt with by the Commission under the provisions of the Act as the cost or part of the cost of the power to be paid by the municipalities forming part of such system under their contracts with the Commission. 8 Geo. V, Cap. 14, s. 13, part.

23d The price payable for power by one system to another shall be collected by the Commission from the system owing the same for the system entitled to receive the same, and all sums so paid to any system shall be applied to the

It is probable that the engineers of the municipality have been negotiating at these revisions and there has been a marked change in municipal conditions since the inception of the system.

The operation of six lines commenced in 1912, connecting the Municipality system with the Ontario System and the Inter-city the Niagara System. By an order dtd., 1916, the electrical power delivered by the system in question was charged for on the basis of $15.00 per horse-power. In 1921, it was decided by the Commission that, explaining with that year, the interchange of power between these systems would be at cost as at the prime rate. With reference to the price to be paid, by the system receiving power, to the system supplying power, the Power Commission has provided as follows:

"The Commission shall have the right whenever physical connections may be made between any of the systems supplying power this act to make the necessary arrangements so as to avoid power from any one system to any other system, and the cost of such connection, and the price to be paid by the system receiving such power to the system supplying such power shall in all cases be determined by the Commission, and the cost of the power so taken by any one system from any other shall be dealt with by the Commission under the provisions of the Act as the cost or part of the cost of the power to be paid by the municipalities forming part of such system under their agreements with the Commission. 6 Geo. V, Chp. 34, s. 19, para.

"The price payable for power by the system to another shall be ascertained by the Commission from the system using the same for the purpose mentioned in paragraphs the same, and all sums so paid to any system shall be applied to the

cost of construction, maintenance and operation of such system in such manner as the Commission may direct. 8 Geo. V, Cap. 14, s. 13, part.

24-(1) The Commission shall annually adjust and apportion the amounts payable by municipal corporations under the next preceding section. R.S.O. 1914, Cap. 39, s. 24.

(2) The Commission shall also annually adjust and apportion among the municipalities all such expenditures made by the Commission in exercise of the powers conferred upon the Commission by this Act, as have been incurred for on behalf* of the municipalities.

(3) The adjustment and apportionment made by the Commission shall be final and binding upon the municipal corporation. 8 Geo. V, Cap. 14, s.14.

*Note - This is the wording of the Act. Presumably the words "for or on behalf" are intended.

The quantities of horse-power of electrical energy delivered by the Eugenia and the Wasdell's Systems to the Severn System together with the power generated by the latter, are as follows:

Particulars	Year ending October 31st, 1918	1919	1920	1921
Received from Eugenia System	*1381.7	*1078.5	17.0	46.0
Received from Wasdell's "	365.0	620.4	496.7	426.6
Generated by Severn "	4163.9	4122.5	5179.0	4968.2
Total Average Horse-power	5910.6	5321.4	5692.7	5440.8
*Note - With line loss deducted the horse-power will be	1337	1047		

costs of construction, maintenance and operation of such system in such manner as the Regulations may direct. S Gen. 7, Reg. 16, as 16, 1974.

64-(1) The commission shall annually as fast and apportion the amounts payable by municipal corporations under the most preceding section. R.S.O. 1924, cap. 89, s. 24.

(2) The Commission shall also annually audit and apportion among the municipalities all sums expenditures made by the Commission in excess of the amount received upon the Commission by rate and, as from time interest for or behalf of the municipalities.

(3) The adjustment and apportionment made by the Commission shall be final and binding upon the municipal corporations. S Gen. 7, Reg. 16, s.16.

"Note - This is the wording of the Act. Commonly the words "for or on behalf" are intended.

The quantities of Hydro-power of electrical energy delivered by the Commission and the "Hydro's Systems to the Ontario Hydro Industry with the power generated by the Income, are as follows:

Particulars	1968	1969	1970	1971
Received from Niagara Plants	[illegible]	[illegible]	[illegible]	[illegible]
Received from Hydro Electric "	[illegible]	[illegible]	[illegible]	[illegible]
Generated by Income "	[illegible]	[illegible]	[illegible]	[illegible]
Total Hydro Kilowatt-hours	[illegible]	[illegible]	[illegible]	[illegible]

"Note - This line does
contained the Hydro-
power will be

1969 1969

By the tie line connecting the Severn System with the Eugenia System either system may draw power from the other in case of emergency, but the other tie line provides only that Wasdell's System may serve Severn System. In the year ending October 31st, 1921, the Severn System received, on an agerage, 46 horse-power more than it delivered to Eugenia System. The two systems, commencing in 1921, were required to pay the maintenance expenses, together with the interest charges and provisions for renewals, contingencies and sinking fund in connection with the tie line, in proportion to the total quantity of power delivered to the municipalities and private customers on each system.

The profit or loss (on the basis of cost of power) to the Eugenia and Wasdell's Systems on power delivered to Severn System, in each of the four fiscal years ending October 31st, 1921, has been creditad or charged to the municipalities included in those systems. The result of the charges, as outlined in the foregoing, to the Severn System for power delivered thereto as compared with the cost of power - on the cost plan adopted - to those systems, is summarized below:

Power Supplied by Eugenia System:

Particulars	Year ending October 31st, 1918	1919	1920	1921
Revenue collected from Severn System	$34,541	$ 26,961	$ 436	$ 6,41
Operating Costs, including Fixed Charges	25,242	25,270	9,218	6,39
Excess or Deficiency in amount paid for power by Severn System to Eugenia System as compared with cost of the power to Eugenia System	$9,299	$1,691	$8,782	$2

Power Supplied by Wasdell's System:

Particulars	Year ending October 31st, 1918	1919	1920	192
Revenue collected from Severn System	$9,125	$15,509	$12,417	$12,36
Operating Costs, including Fixed Charges	12,312	14,920	14,712	12,36
Excess or Deficiency in amount paid for power by Severn System to Wasdell's System as compared with cost of the power to Wasdell's System	$3,187	$589	$2,295	-

Summary of Eugenia and Wasdell's Systems:

Particulars	Year ending October 31st 1918	1919	1920	1921
Revenue collected from Severn System	$43,666	$42,470	$12,853	$18,781
Operating Costs, including Fixed Charges	$37,554	40,190	23,930	18,753
Excess or Deficiency in amount paid for power by Severn System as compared with the combined cost of power to the Eugenia and Wasdell's Systems	$6,112	$2,280	$11,077	$28

For the period from the commencement to October 31st, 1917, the profits amounted to $9,935.28 and $7,498.77 respectively, for the Eugenia System and the Wasdell's System, on power sold to the Severn System and these amounts have been credited to municipalities included in the two systems in proportion to their respective maintenance costs, as stated in the audit report of Mr. S. T. Clarkson for the period ending on that date. From the time power was first purchased by the Severn System from these two systems, to October 31st, 1921, it paid in excess of the cost of power, to those systems, $14,777.00 of which $12,171.00 and $2,606.00 were received by the Eugenia System and by the Wasdell's System respectively.

Summary of Income and Expenses

Particulars	Year	Year	Year	Year
	That ending December 31st			
Revenue collected from General Sales Purchasing Utility, including Plant Charges	[illegible]	[illegible]	[illegible]	[illegible]
Excess or Deficit in working with the Power Authority Revenue as compared with the Operating cost of Power to the Thousands and Hundred's Dollars	[illegible]	[illegible]	[illegible]	[illegible]

For the period from the commencement to October 31st, 1917, the operating expenses in [illegible] and [illegible], respectively, for the Niagara System and the Municipal's System, on power sold to the Power Division and there charges have been credited to municipalities included in the two systems in proportion to their respective outstanding assets, as stated in the audit report of Mr. G. G. Gardner for the period ending on that date. Since the time power was first purchased by the Hydro System from Ontario, in October 31st, 1921, it has in essence of the cost of power, in those expenses, [illegible] of which [illegible] and [illegible] were incurred by the Niagara System and by the Municipal's System respectively.

COPY

POWER DATA

Population Served

The district served by the system is both urban and rural, but the bulk of the load is in the towns of Barrie, Collingwood, Penetanguishene and Midland. A large block of power is also supplied to the Canadian Pacific Railway Company for the elevator at Port McNicoll. WJF. p.19

The following table gives in detail the number of consumers at the end of the fiscal year 1921 in the places served by the system, the approximate horse-power billed to each place in 1921, the total kilowatt-hours consumed on the system in 1921, together with the average horse-power and average kilowatt-hours per consumer. The figures are useful for comparison with other systems although they should be used with caution. WJF. p.19.

Orillia, which is the largest power consumer in the district, is not one of the partner municipalities regularly served by the Commission, but the Orillia Water and Light Commission, which has its own plant at Swift Rapids, has an agreement with the Commission permitting the exchange of power in either direction between the Swift Rapids plant of the Orillia Commission and the Eugenia Falls, Big Chute, and Wasdell's Falls plants of the Hydro-Electric Power Commission, these four plants being regularly operated in

POWER PLANT

Transmission Service

The electric service of the system is both urban and rural, but the bulk of its load is in the towns of Dorpis, Dalington, Ramsayvillemen and Ballard. A large block of power is also furnished to the Commonwealth Traction Company through the substation at Port Monicoll.

The following table gives in detail the number of customers at the end of the fiscal year 1921 in the places served by the system. Commonwealth Power-Power Utilities Company plans in 1921, the total kilowatt-hours consumed on the system in 1921, together with the average horsepower and average kilowatt-hours per consumer. The figures are taken from companies with whom system contracts they should be used with caution.

Utility, which is the largest power consumer in the district, is one of the private municipalities regularly served by the Commonwealth. Bag the Utility Company and Ligh Commission, which has its own plant at Dorpis Dorpis, has an agreement with the commission providing the exchange of power in either direction between the Dorpis Dorpis plant of the Utility Commission and the Hogarth Falls, Dig Ghats, and Vandell's Falls plants of the Dorpis-Dorpis Power Commission, these four plants being regularly operated in

parallel, and it has been stated in recent evidence that the Orillia Commission has supplied to the Severn System as much as 2,000 horse-power at one-quarter cent per kilowatt-hour in one year. WJH. p.20

Table of Market Statistics

Municipality	Population 1921	Consumers 1921	percentage consumers to population.	H.P. Billed 1921	Kilowatt hours 1921	Billed H.P. per consumer	Kilowatt hours per consumer.
Alliston	1,301	370	28.0	133.5		0.36	
Barrie	6,876	1,643	23.9	788.6		0.48	
Beeton	580	111	19.1	87.5		0.79	
Bradford	901	110	16.5	53.0		0.55	
Coldwater	662	138	20.8	67.9		0.49	
Collingwood	6,016	1,439	23.9	859.0		0.60	
Cookstown	(500)	101	-	57.5		0.57	
Creemore	603	172	28.5	46.2		0.27	
Elmvale	(500)	171	-	150.8		0.88	
Midland	7,129	1,424	20.0	1218.3		0.85	
Penetanguishene	3,896	492	12.6	759.5		1.55	
Port McNicoll	614	133	21.7	37.7		0.28	
Stayner	927	238	25.7	115.5		0.49	
Thornton	(500)	43	-	12.3		0.29	
Tottenham	452	152	33.6	35.2		0.23	
Victoria Harb'r	1,462	133	9.1	47.0		0.35	
Waubaushene	(500)	8	-	23.2		2.90	
Camp Borden				58.2			
C.P.R.Elevator				877.3			
Dept. of Railways and Canals				12.6			
Totals -	33,426	6,998	20.9	5440.8	16,784,761	0.78	2,399

In the annual reports of the Commission, the letters P. V. appear in place of population in the cases of a number of the smaller municipalities. In compiling the figures in the annual report for total population a round figure of 500

[illegible]

[illegible]

[illegible]

is added for each of these places. This number has been included in this report as the population of each of these places in obtaining the average kilowatt-hours billed per capita for 1921.

The average horse-power billed per consumer and per capita, and the average kilowatt-hours per consumer and per capita are as follows:

Average horse-power billed per consumer	0.78
Average horse-power billed per capita	0.16
Average kilowatt-hour billed per consumer	2,399
Average kilowatt-hour billed per capita	502

Growth of Market and Ultimate Sources of Power Supply

Since the commencement of operations the growth of the system has been fairly steady. The loads on the system were as follows, the figures being given in horse-power for the month of October in each year:

1911	220
1912	540
1913	1283
1914	1630
1915	3370
1916	5865
1917	7853
1918	5780
1919	6202
1920	6411
1921	5698

These figures do not show the actual peak demands of the system, but they do indicate the growth of the demand. The figures for 1915, 1916 and 1917 include large loads supplied to the Orillia Water and Light Commission for munition work and during the construction of the Swift Rapids plant.

is added for each of these places. This method has been adopted in this report as the description of each of these places in operating the average kilowatt-hours billed per origin for 1921.

The average horse-power billed per consumer and per origin, and the average kilowatt-hours per kilowatt and per origin are as follows:

Average horse-power billed per consumer	0.72
Average horse-power billed per origin	0.12
Average kilowatt-hour billed per consumer	8,000
Average kilowatt-hour billed per origin	1,340

Growth of Central Stations.

Since the commencement of operations the growth of the system has been fairly steady. The lines on the opposite page show, the figures being given in horsepower for the years of growth in work done.

1911	349
1912	481
1913	1,203
1914	1,420
1915	2,870
1916	3,000
1917	7,200
1918	4,800
1919	4,000
1920	4,211
1921	6,840

These figures do not show the actual load demands of the system, but they do indicate the growth of the demand. The figures for 1918, 1919 and 1920 include large loads supplied to the Sprite Motor and light manufacture for munitions work and during the [illegible]

Owing to the inter-connection of the Nasdell's Severn and Eugenia Systems, and the method of keeping the records by the Commission, it is impracticable to separate the records satisfactorily so as to indicate the actual peak on any one part of the Combined Northern Systems. Briefly, it may be noted that in 1921 the total of loads billed to the municipalities is nearly four times as great as it was in 1914, the year when the Big Chute plant was purchased by the Commission.

The ratio of consumers to population at the end of 1921 was 20.9 per cent. which compares well with other systems. The general growth in the load and in the number of consumers has been comparatively steady making due allowance for the abnormal conditions following the armistice in November, 1918, and the indications are that the demands are still increasing.

The situation at the present time is that the Severn System is loaded to the full capacity of the Big Chute plant. The Eugenia System is likewise fully loaded and therefore has no spare capacity for the Severn System. It is proposed to develop the Port Severn site but this has a comparatively small capacity and will probably fill the load requirements for a year or two at most. The available power from the Orillia plant at Swift Rapids is very uncertain.

This brings up the question of the ultimate use of power in the district and the future source of power supply. If Niagara power be used it would necessitate the building northwards of a number of short tie lines, which must be

Owing to the inter-connection of the "Dabeil's" Water and Sewerage System, and the nature of supplying the results by the Gravitation, it is impossible to separate the results satisfactorily so as to indicate the actual gain for any one year of the Dabeiel Waterworks System. Briefly, it may be stated that in 1921 the equal of twice filling is the equivalent of nearly four times as great as it was in 1919. The year that the Alt Glass plant was purchased by the Commission.

The price of sewerage is principally at the rate of 1cent per 1m.3 per week, which requires well with water pressure. The general grounds in the town and in the district of Dabeiel are such as to make it necessary to have some conveniently steady working due efficiency for the observed conditions following the distribution in Dabeiel, and the indications are that the demands are still increasing.

The situation of the Dabeiel Gas Plant is fairly the same system is leased by the full capacity of the Alt Glass plant. The Dabeiel System is limited fully loaded and there has no spare capacity and the system fluctuates. It is proposed to develop the Dabeiel Gas Plant which has this has a considerably small capacity and will probably will be used regularly for a year or two at least. The available power from the Utility Plant at Alt Glass is very considerable.

This judge of the position of the distribution can of point in the statistics and the Water service of Dabeiel. If Sidgers power to work it would necessitate the building additionals of a number of miles of mains, which must be

connected to the Severn System through frequency changers, since Niagara power is developed at 25 cycles.

To use power from the French River for the Muskoka System and for the Combined Northern Systems, and possibly for the Nipissing Section and for the northerly portion of the Trent Section of the Central Ontario System, long transmission lines from the French River to Nipissing, and from Nipissing to Muskoka, and from Muskoka to Wasdell's and to the Trent Systems would be required. As all of these systems are operated at 60 cycles, the use of French River power, which is contemplated at 60 cycles, would avoid the use of frequency-changing apparatus. The development of the French River sites would depend on the growth of the load on the Combined Northern Systems, and in the North Bay-to-Sudbury district to a sufficient degree to permit of their economical use. If the general power demand continues to increase at a rapid rate, the total economical capacity of the French River sites, which is probably about 20,000 horse-power, might be reached within a comparatively few years, in which case Niagara power would be the only feasible source of supply. From an operating point of view it would be preferable to use power generated at 60 cycles and avoid the complication of frequency-changers. It is understood that the Commission contemplates the use of some Niagara power through frequency-changers in the near future, for the Eugenia System.

If Niagara power be used it might prove desirable

economical in the service "prime movers" through frequency changers, since Niagara power is developed at 25 cycles.

If one power from the Niagara River for the Buffalo area and for the Toronto District "Hydro", and possibly for the Niagara District would be not for the marginal position of the Niagara Falls in the natural industrial drama, high transmission lines from the "Niagara" to Niagara, and from Niagara to Toronto, and from Toronto to Niagara's and to the Niagara Falls would be required. In all of these systems are operated at 60 cycles, the use of "round Niagara power", which is accomplished at 25 cycles, would mean the use of frequency-changing systems. The relationship of the Toronto District with Niagara Falls depend on the power at one time on the Niagara Systems, and in the north Ontario District as a minimum degree to power of their economical use.

If the general power demand continues to increase at a rapid rate, the total economical capacity of the Toronto District which is probably about 25,000 horse-power, might be reached within a comparatively few years. In this case Niagara would be the only feasible source of supply. From an operating point of view it would be preferable to generate at 60 cycles and avoid the complication of frequency-changers. It is recognized that the Toronto Hydro-Electric Commission would be not for the marginal position of the Niagara power through frequency-changers in the near future, for the Niagara District.

If Niagara power is used it might have particular

to separate a number of the municipalities from the present partnership arrangement on the Severn System and add those municipalities to the Niagara System, in which case the accounting should take into consideration the re-allocation of the cost of that portion of the system so affected.

On the other hand, if power be transmitted from the French River, a system of billing for each of the four or five systems affected would have to be developed so as to fairly apportion the costs of the transmitted power. WJF. p.21, 22 & 23.

Horse-Power Developed, etc.

The following table shows the horse-power developed, consumed, billed, etc., from 1914 to the 31st October, 1922: WJF. p.27

	1914-1917	Fiscal year ending October 31, 1918	1919	1920	1921	1922
H. P. Developed	2,900	2,900.0	4,600.0	4,600.0	4,600.0	4,600.0
H. P. Purchased	-	1,746.7	1,698.9	513.7	472.6	-
H. P. Developed plus Purchased	2,900	4,646.7	6,298.9	5,113.7	5,072.6	4,600.0
H.P. Consumed, average	-	-	-	-	2,568.0	3,060.0
Total H.P. billed	-	5,910.6	5,829.4	5,692.7	5,440.8	5,404.0
H.P. Billed to System from Big Chute		4,163.9	4,122.5	5,179.0	4,968.2	4,968.2

Power Situation

The market for power has been well covered in the district. The density indicates a high percentage of consumers per capita of population. The demand for electricity is

to separate a number of the municipalities from the present partnership arrangement at the Niagara Falls and place municipalities on the Hydro System, in which case the accounting should also take consideration the re-allocation of the cost of that portion of the system so situated.

In the other hand, if power be transmitted from the Niagara River, a system of billing for each of the four or five separate systems would have to be devised so as to fairly apportion the costs of the transmission power.

Rate-Chart Involved, etc.

The following table shows the horse-power developed, received, billed, etc., over 12½ as the fiscal years, 1924.

Fiscal year ending October 31.

	1924	1923	1922	1921	1920
T. P. Developed	5,000	5,000.0	4,400.0	4,800.0	4,600.0
H. P. Purchased	-	1,744.7	1,000.0	630.7	472.4
T. P. Developed					
plus Purchased	5,000	6,744.7	5,400.0	5,110.7	5,072.4
T.P. Generated-storage	-	-	-	-	2,000.0
Total H.P. Billed	-	3,918.0	3,028.4	2,922.7	2,640.0
H.P. Billed to System from Big Chute		5,327.7	4,122.5	3,177.0	4,944.3

Power Elsewhere

The excess of power has been well entered in the diagram. The energy indicates a high percentage of consumers per mains of population. The energy for electricity is

apparently still growing and indications are that further sources of power supply must soon be provided. The ultimate demand for power and ultimate sources of supply should be considered in the near future because the local economical power sites will probably soon all be utilized. WJY. p.58

GENERAL RELATIONS

Relations with the Town of Orillia and the Orillia Water, Light and Power Commission

As stated on pages 11, 12, 13 and 14 of this report, the Severn, Eugenia and Wasdell's Systems are so connected that they may be operated in parallel with the system operated by the Town of Orillia.

This parallel operation is provided by an agreement dated December 9th, 1919, between the Commission and the Town of Orillia, represented by the Orillia Water, Light and Power Commission, which was approved by Order-in-Council dated April 28th, 1920.

The agreement is a reciprocal one, whereby each of the systems gives the other first call on any surplus of power it has available, and is binding for a period of 15 years from the 1st November, 1916. We are informed by Mr. T. G. James that the Orillia System under this arrangement has available, at most times, 2,000 horse-power for Hydro purposes, and in his estimation this amount will be available for some years to come. It will be seen on perusing Paragraph 6, Sub-section (a) that the Power Commission are "to purchase from the corporation for $10,000.00 with interest at 6 per cent. per annum from 1st November, 1918, that part of the transmission line now owned by the corporation connecting the Big Chute development with the corporation's abandoned plant

EXECUTIVE DIRECTORS

and the Drilling Rates, Light and Power Committee

Extracts from the Town of Drilling.

As stated on pages 13, 14, 15 and 16 of this report, the towns, Chemnis and Dunhill's Corners are so commonly that they may be operated in parallel with the Drilling system of the Town of Drilling.

This parallel operation is provided by an agreement dated December 6th, 1919, between the Dunhill-and the Town of Drilling, countersigned by the Drilling Water, Light and Power Commission, which was approved by Order-in-Council dated April 20th, 1920.

The agreement is a reciprocal one, whereby each of the systems giving the other first call to any surplus power it may available, and is signed for a period of 10 years from the 1st December, 1919. In our interim Br 30, T. 2. Jones says the Drilling Electric Water Light Commission, at most times, 2,000 kw-hours for Light Power, and in his estimates this amount will be available for power in the Dunhill Commission area for 10 years. It will be seen on inspecting Appendix B, that Power in demand. It will be seen on inspecting Appendix B, the expansion (s) that the Power Commission has "is purchased from the expansion for 210,000,00 with interest at 6 per cent. Our estimate that 1st December, 1919, this year of the expansion for 210,000,00 with interest at 6 per cent.

at Ragged Rapids". The Power Commission subsequently carried out this part of the contract.

Clause 6 (g) of the agreement requires the Commission to pay the corporation the sum of $750.00 per annum from 1st November, 1916, as compensation "for rental for the use of the lines of the corporation by the Commission for passing power from the Wasdell's System to the Severn System and vice versa".

In addition to the above, the Power Commission has a subsequent contract with Orillia, dated September 1st, 1922, whereby 800 horse-power at a price of one-quarter cent (¼¢) per kilowatt-hour is reserved for the Power Commission until September 1st, 1923.

Regular parallel operation of the systems with the Orillia System was begun on June 1st, 1916, and our Consulting Engineer states that it has proved a great advantage to all the systems concerned.

of Tagical Depot". The power functions automatically carried out this part of the contract.

Since 4 (g) of the agreement requires the Township to pay the compensation the sum of $850.00 per annum from 1st November, 1929, as compensation "for annual the use of the lines of the municipality by the Township for passing power from the municipal system to the Hydro System and vice versa".

In addition to the above, the Power Commission has a subsequent contract with Drilla, dated September 1st, 1928, whereby the Commission is to supply the Township with light for illumination in connection the Power Commission until September 1st, 1934.

Complete parallel operation of the system with the Drilla System was begun on June 1st, 1928, and the Commission Engineer states that it has proved a great advantage to all the systems concerned.

SUMMARY

In the foregoing sections of this report comment has been introduced from time to time to make the various statements clear. No public hearing was held in reference to matters connected with this system, in consequence of which the report is based entirely upon facts and figures supplied in the official reports of the accountants, Messrs. Price, Waterhouse & Company, and the Consulting Engineer, Mr. Walter J. Francis.

In order to direct attention to the matters on which the Commission may desire to give particular attention, hereunder is given a brief summary of the points which appear to require special consideration.

1. Capital Investment ("General Economics" - p.16-18.)

The total capital investment as at October 31st, 1921, amounted to $1,406,847.00. It is to be noted that this amount includes the sum of $124,011.00 shown on the books of the Commission as intangibles and may be said to represent the leasehold rights at Big Chute, the rights of development on the Port Severn site and the unexpired power contracts and franchises taken over by the Commission from the Simcoe Railway & Power Company, who were the original owners.

S U M M A R Y

In the foregoing sections of this report attempt has been introduced from time to time to make the reviews chronologic order. In public hearing was held in reference to matters contained this this review, in accordance of which the report is based entirely upon facts and figures supplied in the official records of the commission, Senate, Dail, newspaper & Company, and the "Evening Herald" Dublin, Mr. Colin J. Brown.

In each of these instances in the matters in which the Commission may desire to give particular attention, hereunder is given a brief summary of the points which appear in respective special examinations.

1. Postal Department ("Postal Telegraphs" - p.18-19)

The total capital investment as at October 31st, 1921, amounted to £1,409,847.00. It is to be noted this amount includes the sum of £224,211.00 alone on the Dublin to the Commission as Insurgities and may be said to represent the Immediate rights of Dail Eireann, the rights of Government on the Post Office Wire and the Telegraph Cable Networks and Telephone Lines over by the Commission upon the Dublin Dailing & Peter Hughes, who were the original owners.

2. Reserve for Renewals ("General Economics" - p.20)

The reserve for renewals appears to be quite adequate to take care of renewals on depreciable items.

3. Reserve for Sinking Fund ("General Economics" - p.21A)

Reserve for sinking fund has been provided for in the cost of power in accordance with the Power Commission Act to form in thirty years, with interest at 4%, the amount of capital invested.

4. Reserve for Contingencies ("General Economics" - p.22)

In addition to an annual charge of 25¢ per horse-power in respect of this amount, other amounts representing profits realised on sale of power to sundry customers together with profit from sales of miscellaneous equipment have been used to augment this fund. The total amount to the credit of this fund as at October 31st, 1921, was about $7,128, and it is the opinion of our Consulting Engineer that this amount should be augmented by increasing the annual allowance for intangibles and when a reserve of say $20,000 or $30,000 will have been built up the rates can be re-adjusted to suit the conditions found after several further years of operation.

5. Accounts with Municipalities ("General Economics" - p.23)

(a) The balance in the Power Accounts Receivable at October 31st, 1921, amounted to $43,621.00. These accounts

3. Energy for Industry ("General Economics" - p.50)

The problem for research workers is to quite adequate to some case of research on industrial issue.

2. Energy for Electric Power ("General Economics" - p.55)

Energy for electric fuel has been provided for in the use of power in accordance with the annual "Statistics and to form in future years, with increase of 4% per annum of output increase.

4. Energy for Transportation ("General Economics" - p.32)

In addition to an annual energy of 3% per increase power in regards of this energy, other sources representing profits realized on sale of power to country enterprises together with profit from sales of nationalization equipment have been used to support this fund. The total income in the credit of this fund as of October 21st, 1953, was about $7,120, and is in the opinion of our Committee Engineer that this amount should be augmented by increasing the annual allowance for improvements and also a reserve of not 10%,000 or $20,000 will have been built up the amount can be re-allocated to suit the construction fund after several further years of operation.

4. Agency with Guarantee ("General Economics" - p.32)

(a) The Balance in the Power Agency Receivable as October 31st, 1952, amounted to $43,511,07. There currently

represent unpaid balances in respect of interim power bills, which are paid currently by the municipalities.

(b) As at October 31st, 1921, there was a debit balance amounting to $56,175.48 against thirteen municipalities in the system and a credit balance of $2,705.54 against four municipalities. Some of the debit balances extend back to the first year of operation and beyond the three year limit as authorized by the Act. The accounts were examined by this Commission's accountants in September 1922, and it was found that six of the seventeen municipalities were in default in payment of their power bills.

6. Sale of Power to Private Companies ("General Economics" -p.28)

As at October 31st, 1921, the system had earned a net profit of $59,018 on the sale of power to private companies. This profit directly benefited the municipalities on the system inasmuch as the Commission credited to them as a reduction in the cost of power an amount of $57,916 and credited to the contingency reserve an amount of $1,102.

7. Estimated Power Loads, Compared with Actual Power Loads ("General Economics" - p.33)

Disregarding all municipalities in which loads were not estimated and municipalities which had not been in operation for a full year the loads on which estimates as to the cost of power were submitted greatly exceeded the actual yearly average load.

repayment equal instalments in respect of Income Power Bills, which are paid currently by the municipalities.

(b) As at October 31st, 1951, there was a total balance amounting to $84,370.64 against municipalities in the system and a credit balance of $2,770.04 against non-municipalities. None of the total balances arose due to the first year of operation and further the above year first mentioned by the Act. The accounts were audited by this Commission's representatives in September 1952, and it was found that all the revenues municipalities were in default in payment of their power bills.

6. Sale of Power to Industry (Annual Commission - p.12)

As at October 31st, 1951, the system had issued a net profit of $20,000 on the sale of power to private consumers. This profit clearly benefited the municipalities as the system insofar as the Commission provides to them as a reduction in the cost of power an amount of $27,833 and another to the municipalities returns an amount of $2,127.

7. Estimated Power Losses, Transmission (Annual Commission - p.24)
Sale Legal Power Losses

Disregarding all municipalities in which losses were not assumed and municipalities which had not been in operation for a full year the losses on which estimates as to the cost of power were constructed generally amounted the annual yearly average loss.

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8. Comparison of Estimated Costs per Horse-power with Actual Cost per Horse-power ("General Economics" - p. 33)

Disregarding those municipalities that have not been in operation for a full year, the actual cost of power to the municipalities has exceeded the estimated cost in the majority of the municipalities.

9. Purchase of Power from Other Systems ("General Economics" -p.37)

Power for the Severn System is interchanged with the Orillia plant which is owned by the municipality of Orillia, and is purchased from the Eugenia and Wasdell's Systems. It paid for the power so supplied up to October 31st, 1921, an amount of $14,777 in excess of cost and the supplying systems benefited to this extent. Since that date arrangement has been made by the Commission whereby the interchange of power will be on a cost basis.

10. Future Sources of Power ("General Economics" - p.42)

The Severn System at the present time requires all of the installed capacity of the Big Chute plant and in addition purchases power from other sources. The Commission control an undeveloped power site at Swift Rapids, but before any expenditures are made on the developing power of this site, serious consideration should be given to the possibility of introducing power from the Niagara System or the development of power in the French River District to supply the requirements of the Severn and the two other northern systems, namely Wasdell's System and the Eugenia System.

9. Employing an internal state pur-
-chase with Indian land and development ("General Secretaries" - p. 22)

Differentiating above municipalities it's true that been in operation for a long year. The capital area of Bombay is the municipality has exceeded the maximum that in the majority of the municipalities.

8. Increase of Power from Tata Power Stations ("General Secretaries" - p.21)

Power for the Bombay Stations is interchanges with the Electric Plant which is owned by the municipality of Delhi, and is generated from the Bhakra and Nangal's Dyphons. It pays for the power as supplied up to Kasauri Site, but, on account of Rs.777 in arrears of wages and other employing persons borrowed on this account. Since this data arrangement has been made by the Ministries showing the interchange of power will be on a close basis.

10. Tata Sources of Power ("General Secretaries" - p.21)

The Bombay Dyphon as the Bombay Stn requires all at the Investing capacity of the big steam plant not in addition Bombay power from other sources. The Government contract on Hydroelectric power site or Steam Bombay, the future and expansion were made on the Hydroelectric power of this site, matters consideration should be given to the possibility of interchanging power from the Bombay Dyphon or the development of power in the Kasauri Site Stations to supply the requirements of the Bombay and the two other metropolitan systems, namely Kasauri's Dyphon and the Bhakra Dyphon.

A D D E N D A

It has recently been brought to our attention that the Commission has made substantial reductions in the renewal rates charged in various systems, and that such reductions have been made retroactive to the date of first operation.

Memorandum re Reduction of Renewal Rates on the Severn System

On December 20th, 1922, the Commission passed the following minute reducing the renewal rates on the Severn System:

> "The Chief Engineer having recommended a revised depreciation rate calculated on the basis of the life of the equipment, also having advised that this matter had been taken up with Mr. Francis and approved, it was decided that the depreciation rate for the Severn System should be fixed at 1.35 per cent, and that this rate be made retroactive to the date of first operation."

The rate used by the Commission was 2.75 per cent. and this revision has resulted in a reduction of the rate of 1.40 per cent.

We have been informed by Mr. McPherson, in charge of Hydro accounts in the absence of Mr. Fierdon, that the effect of this revision has resulted in a reduction of the renewal reserve at October 31st, 1921, of $119,976, of which $105,308 has been applied as a credit to the municipalities and $14,668 as an addition to the contingency reserve. The

ANNEXE

Il lui récemment leur tempsi ce que stratégique
que les commissions ont mais substantiel rationnelles la une
réserve taux chargés la revient dépenses, sont leur mois rétro-
spectives leur ont mois rétrospectives au date et first opéra-
tion.

Amendement au Règlement du Conseil Sénat au sujet Jetons

Le Mercredi 20th, 1967, le Président lisait la
following clause relating the reserve rates as the Senate
Rules:

COPY

"The Chief Engineer having recommended a revised
depreciation rate calculated on the basis of the
life of the equipment, also having advised that
this matter had been taken up with Mr. Dennis
and approved, it was resolved that the depreciation
rate for the Aeron Express should be fixed at
1.40 per cent, and that this rate be made retro-
active to the date of first operation."

The same case by the Commission was 1.77 per cent,
and this revision has resulted in a reduction of the rate of
1.40 per cent.

It have been informed by Mr. Delaney, in charge
of Dyke contracts in the absence of Mr. Dickson, that the
effect of this revision has resulted in a reduction of the
annual returns at Lester Pier, 1967, of $117,777, of which
$107,375 has been applied as a credit to the construction
and $14,640 as an addition to the maintenance reserve.

amount of $105,308, credited to the municipalities has the effect of reducing the cost of power to them throughout the entire period of operation to October 31st, 1921, and would reduce the balances owing by them at October 31st, 1921, in corresponding amounts.

The operating figures in the report are also subject to revision, especially the annual cost per horse-power.

On page 56 of the Consulting Engineer's report it is recommended that the contingency reserve should be increased to $20,000 or $30,000. The balance at October 31st, 1921, of $7,128 together with the additional amount of $14,668, transferred from the renewal reserve would bring the renewal reserve to approximately Mr. Francis' minimum recommendation.

In view of the instructions given no attempt has been made to recast the figures in order that they may conform with the changes recently made, but it is pointed out that in reporting to the Government some reference should be made to the reduction that has been made in the renewal reserve account.

It is also interesting to note that municipalities on the Severn System for the most part will now have credit balances instead of debit balances as previously enumerated in this report.